COAL AGE

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If I Were a Coal-Mine Official—II

I WOULD base all my actions on a single idea—that only teamwork can win. Inferior men pulling together will go further than superior men working independently.

I would never make important changes in policy without first explaining my plans and literally selling my new scheme to my workmen. The men will be with you if they know your aims; they'll be skittish and suspicious if they are in the dark. One successful manager explains from the top of a barrel in the mine yard—a good-sized drygoods box would be as good.

I WOULD remember that all the qualities in my men which caused me to sleep soundly nights might also make them live in contentment if possessed by their boss.

Things Personal

I would endeavor just as far as possible to get the maximum effort out of each workman by taking his viewpoint on the job. Failure on the part of officials to do this is the greatest source of friction. I would explain more often than order. I would try to know each man by his nickname.

I would have the men's thoughts turned to matters of common interest. This might be accomplished by means of a band, a baseball team, a bowling club or all these and more. I would break down all caste between the white-collar men and the fellows in jumpers.

I would never forget that men differ. Some need the spur, some the sugar lump. Some men are lost if work is piled on them. They can handle but one thing at a time. Others do best when they are submerged and have to swim out. Some men are keenest and show highest efficiency when surrounded by discouragement; some are worthless unless cheerfulness prevails. Therefore, I would study those above me and below me.

Matters Commercial

I would not forget that the company payroll will in the end strike a balance with value received. A low wage will buy only scant service. I would set a record for mine and men so that there always would be something to fight for. I would establish a reputation for rewarding faithful and efficient attendance of employees on their duties. The very best stimulant for sluggish ambition is hope of promotion. Higher positions should be filled whenever possible by advancing men already in the company's employ.

Rules are necessary, but they are no good if not read by the men. I would avoid stereotyped bulletin-board announcements. My notices would appear on various sizes, shapes and colors of cardboard, no two would be identical in appearance.

Accidents often make it desirable to prove that workmen have read the company rules. I would require from each man a receipt for the regulation instruction book. I would go still further and have his signature certify that he agrees to read and follow instructions. The law is often a stern taskmaster.

If it is advisable to distribute business information to customers by circular letters, why not use such letters to sell beneficial ideas to employees? I would use mail-order methods frequently in getting my rules and regulations across.

One month of 1917 has passed. I would stop instantly and take inventory to see how many of my New Year's resolves have been kept. If I had lapsed, I wouldn't wait eleven months to start afresh.

(To be continued the first issue in March)

Ideas and Suggestions

Balancing a Three-Floor Drive

By W. F. Schaphorst*

The vertical belt drive has always been a sort of hoodoo and perhaps will so continue. About the only way in which such a drive can be run satisfactorily without keeping the belt drumstring-tight is by the aid of an idler—and some men preach fiercely against idlers.

Personally, I am not opposed to idlers where they are necessary. They do not consume much power if properly designed, aligned, oiled and kept clean. This has been demonstrated conclusively. It has been proved in actual tests that certain idlers consume so little power that the loss is not even traceable.

However, where it is possible to avoid vertical belts and idlers I avoid them. The accompanying illustration

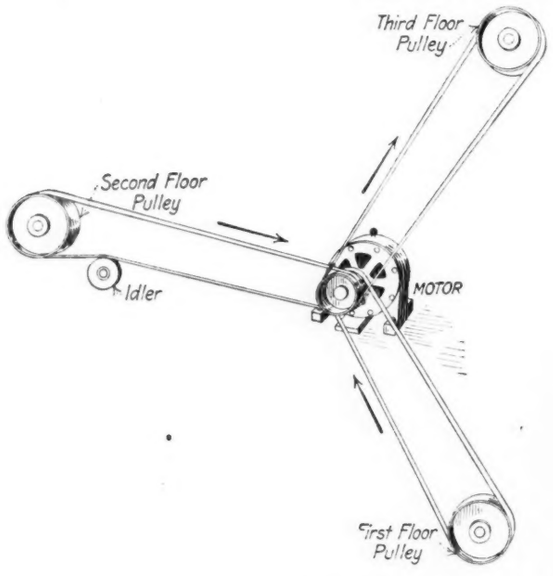


DIAGRAM OF DRIVE

shows an example of a single motor furnishing power for three floors; there is no vertical belt.

Some designers would doubtless have placed the motor on the ground floor, where a good solid foundation could have been obtained, and power would have been distributed through sloping belts, one belt to each floor; or vertical belts would be used in one or several ways.

The principal feature of the drive shown is the almost perfect balance. It is laid out for a distribution of 100 hp. to each floor and, with pulleys of equal size all around, the belt pull from each floor is the same. It is therefore plain that the angle between drives should be exactly 120 deg.

It is unfortunate that all these belts cannot run in the same plane, in which case the balance would be perfect and there would be no thrust whatever on the motor-shaft bearings. But with pulleys close together, and with the use of heavy belts, the thrust with such a design as this is small. This arrangement permits a high efficiency of distribution. About 98 per cent. should be obtained on every floor.

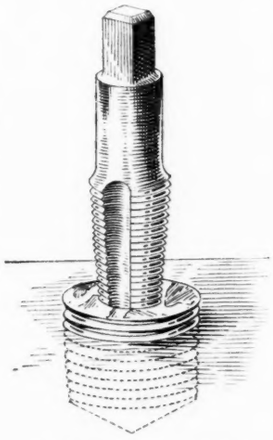
On the horizontal drive I have shown an idler on the under side, which in this instance is the slack side. This idler may or may not be used, as it depends chiefly upon the pulley sizes. Generally, the idler is placed close to the small pulley; but in this case it is used only to hold up the belt and keep it from rubbing against an obstruction.

The matter of balance is always worthy of consideration. It is sometimes advisable to look existing drives over and correct the balance here and there. This can often be done by merely shifting a bearing.

*New York City.

Removing Broken Studs

For some years I have been using the "old approved method" of getting out broken ends of cap-bolts, etc., as shown in the illustration, and find it satisfactory. I first center-punch, then drill a hole about half the full diameter of the bolt, and not quite through the length of the broken end. I have a short and stout pipe tap, with a left-hand thread, that I insert, and cut a left-hand thread until the tap bottoms in the hole. Then by a little force the broken end of the bolt will in most cases unscrew, leaving the tapped hole in perfect condition for a new bolt. Driving in a square drift does not always prove successful, but the left-hand thread tap draws itself in and there is no slip, and by reasonable care the tap will not break, says Charles L. Davis in *Power*.

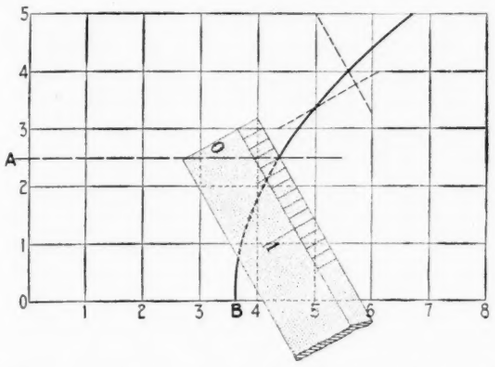


LEFT-HAND TAP TO UNSCREW STUD

Reading Copied Charts

When it is found necessary to read coördinate values from curves that have been reduced for printing, it is often difficult to measure these directly with a scale, because the curves are ordinarily not reduced to any particular scale for this purpose. When it is necessary to determine these intermediate values closer than can be done by estimating, the following method described in the *Engineering and Mining Journal* will give accurate readings, using any scale: As shown in the illustration, place an ordinary graduated scale with one grad-

uation on one ordinate line and another graduation on the ordinate line below it, and then slide the ruler along until the edge intersects the curve at the point to be read. If the scale used is divided into tenths, the reading is a

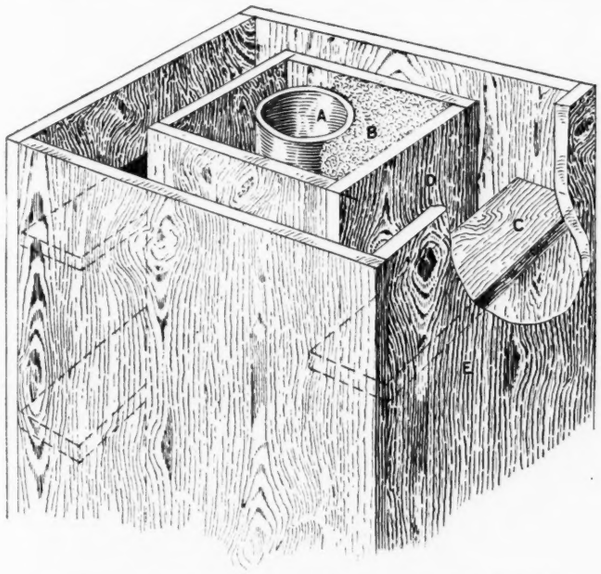


METHOD OF READING ACCURATELY COPIED CHARTS

direct decimal and if not divided into tenths the reading is a fraction, which is easily handled. This is based on the theorem of proportional triangles.

Water-Pipe Frost Protection

In cold climates, outside water pipes should be boxed as illustrated, says J. E. Noble in *Power*. *A* is the pipe to be protected, *B* is dry sawdust with a small quantity of unslaked lime in it (when so treated rats and mice will leave the box severely alone), and *D* is the inner box containing the sawdust, allowing about 2 in. of space



CASING TO PROTECT WATER PIPE FROM FROST

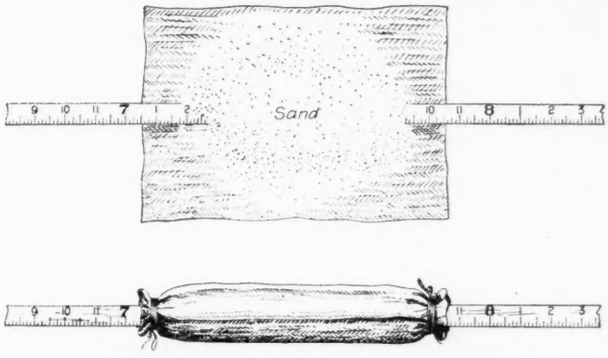
clear of the pipe. The inner box is made of ⅞-in. boards, and the outer box *E* of 1¼-in. boards. At intervals strips of wood about 2 in. wide are nailed on, as at *C*, to hold the inner box central. Care must be taken to make a tight job of the outside box, as it is necessary to prevent a circulation of air to any extent in the space between the boxes. Cut straw, asbestos and cement, powdered mica, mineral wool or ground tanbark can be used instead of the sawdust if desired.

Scouring Steel Tapes

By W. L. Herbert*

Steel tapes that have been neglected or otherwise allowed to become rusty so that the graduations are invisible or indistinct may readily be cleaned by the following method.

The tape is laid across a piece of cloth upon which is placed a small amount of sharp sand or emery. The cloth is then rolled up on the emery and tape and



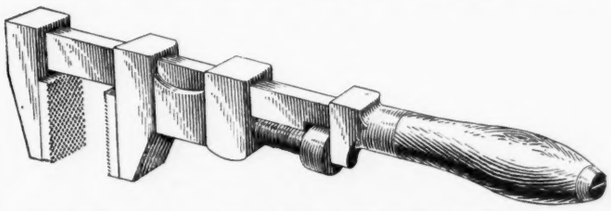
APPLICATION OF SAND AND CLOTH

the ends tied with a bit of string to prevent loss of the abrasive. The cloth roll is then rubbed back and forth along the tape to scour it.

Those who have used this method say that it is a decided improvement over sandpaper, emery cloth or loose abrasive held in the bare or gloved hand. It saves much time and energy.

An Emergency Pipe Wrench

A construction gang putting up a small boiler and engine in the country was hampered to some extent because part of the tools (including all the pipe wrenches)



PIECES OF OLD FILE ON MONKEY-WRENCH JAWS

had not arrived on the job. Since no other wrenches were available, the men proceeded to make a pipe wrench out of an ordinary monkey wrench by soldering two pieces of an old rough file on each jaw of the wrench, as shown in the illustration from *Power*. They used this for two days, according to M. A. Saller, and did a good bit of work before the lost shipment turned up.

Steel Tipples Can Be Protected from Corrosive Action of moist mine air by any or a combination of the following simple precautions: (1) Leaving the sides of the head frame open; (2) spreading the legs of the head frame, thus removing them from the shaft collar; (3) using a few large steel members for head-frame construction instead of the more quickly corroded small sections; (4) incasing the legs or posts in concrete close to the shaft; (5) more frequent scraping and painting.—E. A. Holbrook in "Dry Preparation of Bituminous Coal at Illinois Mines," Bulletin 88 Illinois Engineering Experiment Station.

*Star Junction, Penn.

Allegheny River Mining Co.'s Cadogan Tipple

By H. Reisser*

SYNOPSIS—Three beds of coal are worked simultaneously. The tipple is a double unit; that is, it consists of two sets of shaking screens, picking tables and loading booms. The track layout for loaded mine cars is particularly interesting, as it would appear that practically every possible contingency had been provided for.

The mining district around Kittanning, Penn., boasts of what is probably one of the most modern and cleverly planned tipples in that section. This has been built at the Cadogan mine of the Allegheny River Mining Co. and is located on the west bank of the Allegheny River in North and South Buffalo townships, in Armstrong County, Penn., about 5 mi. south of Kittanning, on the Pittsburgh & Shawmut R.R.

Three working beds supply coal to the operation—the lower Kittanning, or "B" seam; the lower Freeport, or "D" seam, and the Upper Freeport, or "E" seam. The "B" seam is found about 40 ft. above the normal river stage and has a thickness of from 42 to 60 in. The "E" bed is 45 ft. above the "B" with practically the same thickness of coal, while the "D" bed is considerably higher up.

The "B" seam crops full thickness on the river front and runs uniform for miles. The Freeport beds, however, are not so regular, thinning out on the edges in all directions from the body of the seams, thereby limiting the favorable points of attack to an area the edge of which is parallel with and about a mile back from the river.

The territories covered by the Freeport bed are irregular in shape and less in area than those of the "B" seam. They are of such magnitude, however, as to warrant large operations in both measures. The Freeport beds are worked with entries directly above one another, while the "B" vein is worked independently, inasmuch as the interval between it and the "D" seam is about 250 ft., composed of several sandstone and sand shale strata not likely to cause any disturbance in the upper beds from subsidence in the lower.

The upper workings, with a mile handicap at the start, are being kept ahead of the lower ones. The coal in the three beds is of excellent structure and quality and the roof and floor conditions are favorable. The ground in the immediate vicinity of the operation offers an excellent opportunity to bring modern efficiency into play, from the standpoint of the highest possible capacity at all times.

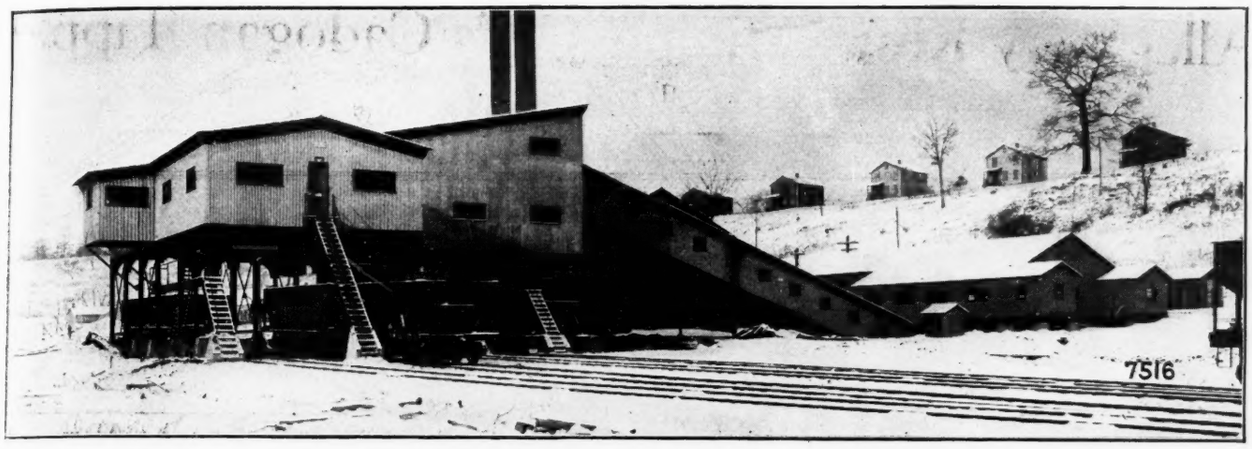
In the engineering of the yard system behind the tipple every possible chance for delay, congestion and accident has been considered, and there seems to be no flaw in the layout that might hinder the continual increase in tonnage up to and beyond the hourly capacity that the operation is designed to meet.

The general plan of the tipple, which is a double unit throughout, can be grouped under the three following headings: (1) The dumphouse, (2) the conveyor gallery and (3) the screening house.

GENERAL VIEW OF YARDS, TIPPLE AND POWER PLANT

The dumphouse contains the feeding hauls, the car stops, the crossover dumps, the dump hoppers and the reciprocating feeders. In detail the sequence of operations is as follows: Trips of cars are brought into the dumphouse onto the two feeding hauls. A distinct feature is here introduced. It is usually customary at this point to have the motor that hauls the strips switch out and push the trip the remaining distance between where it uncouples and the hauls. In this case, however, the motor runs over the hauls, switches out, and then returns directly over the returning empty track to a point beyond where this passes onto the motor track. It will be ob-

*Chicago, Ill.



NEAR VIEW OF TIPPLE, POWER PLANT IN REAR

served that by this method the delay caused by the motor running back to the end of the trip is eliminated.

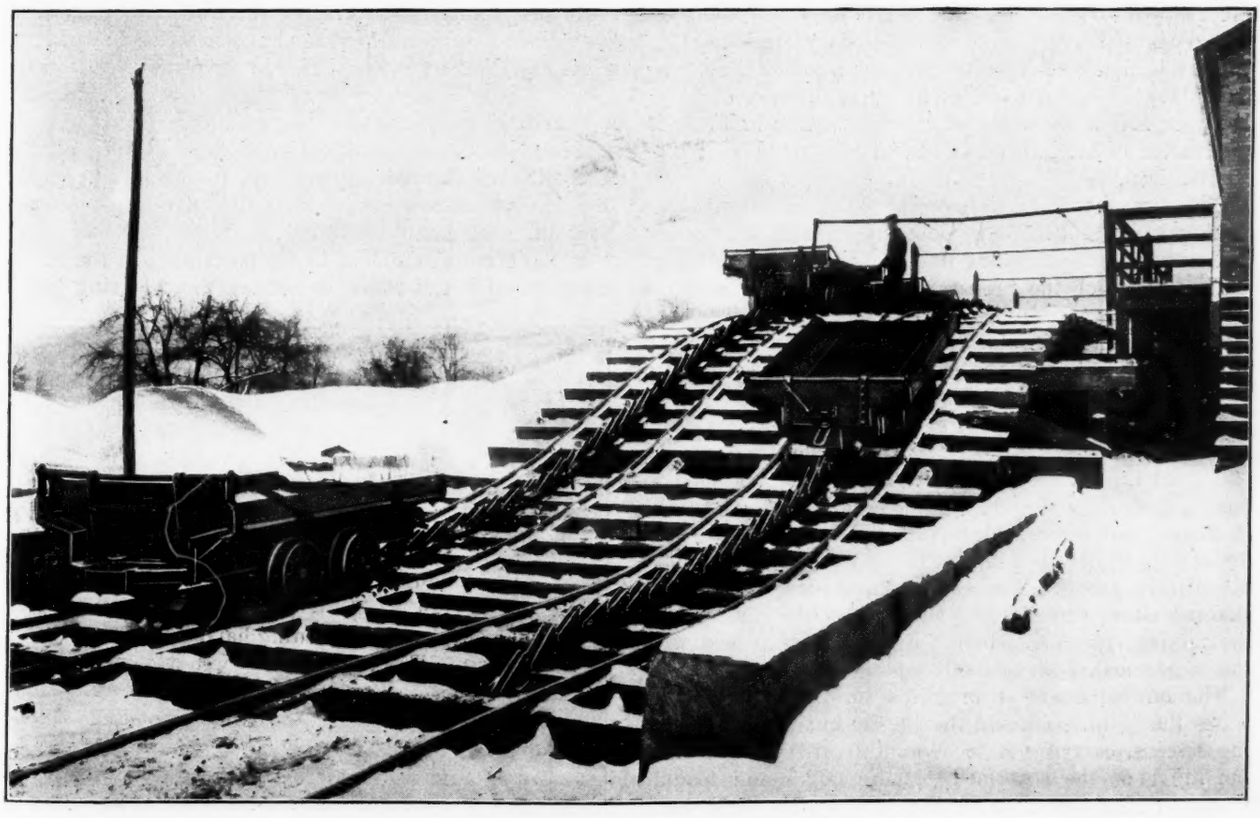
The feeding hauls are of generous proportions and have cast-steel gravity-tilting dogs at regular intervals. These are mounted on heavy steel link-belt and are designed to take care of trips of 250 cars each. They feed the cars, which are uncoupled at the head end, each car being pushed by the following one over the quick-weighing platform scales. This permits the weighmaster to record the weight of each car while in motion.

Before reaching the dump, however, the cars pass into an automatic car stop, the function of which is to eliminate the possibility of the car smashing into the sword of the crossover dump. These stops are so connected to the dumps, that they do not interfere with the cars unless they are coming too fast.

The crossover dumps are of the Phillips type and have spread rails. By their aid the cars are emptied and the coal is discharged into the plate-steel dump hoppers. From the dumps the empty cars pass into a kickback and run by gravity into the trip makers, which are of an improved design of the steel saw-tooth type and eliminate the use of safety pawls or brakes. They do not allow a fast car to smash into a slow one, which of course obviates considerable wear and tear on the cars.

The trip makers elevate the cars to sufficient height and they are coupled up at the head end of the hauls and pushed back, to be taken into the mine when sufficiently large trips have been made up.

The reciprocating feeders are fastened to the bottom of the steel dump hoppers and feed the coal onto the inclined conveyors, which pass upward through the conveyor



A PAIR OF TRIP MAKERS AT WORK

INTERIOR OF TIPPLE, SHOWING CAR DUMPS

gallery. The entire dumphouse is constructed of white oak timber covered with corrugated iron and is amply provided with light.

The conveyor gallery covers the two 42-in. conveyors. These are of the corrugated steel-apron type and are mounted on two strands of steel bushed roller chain. They form the medium between the feeders and the screens in the screenhouse and travel on structural steel frames on which are mounted stationary steel sides to retain the high coal capacity. At the head of these conveyors steel discharge chutes are placed, each of these emptying into a set of shaking screens. The building is constructed of steel throughout and is covered with corrugated iron.

The screenhouse contains the shaking screens, the picking tables and loading booms, the mixing and boiler fuel conveyors, the crushing unit and the refuse conveyor.

The design of the preparation equipment is such as to prepare the coal from each bed separately. The fact that at no time is coal from all three beds brought to the tipple together makes this possible. However, two kinds of coal can be and are loaded simultaneously.

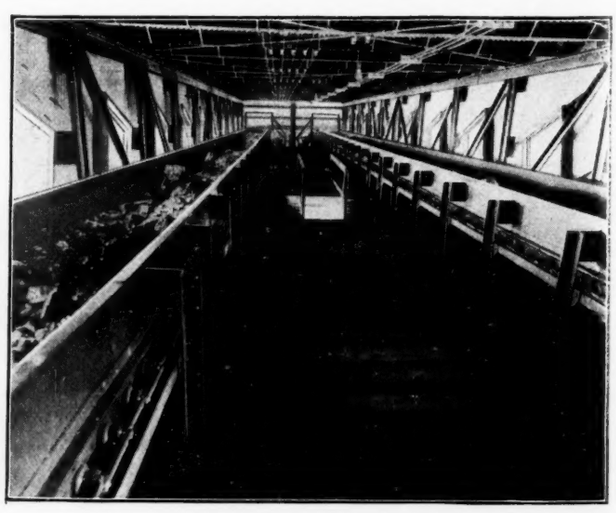
The shaking screens, which are hung in tandem from heavy forged steel adjustable hanger rods, receive the coal from the inclined conveyors. They are arranged to remove first, all coal under ¾ in., termed slack, by means of flanged lip screens; next, all coal above ¾ in. and under 1¾ in., termed nut. The larger sizes pass onto the picking tables. The above named sizes can be discharged either directly into their respective cars or into the mixing conveyor, where they are again placed with the larger coal, after it has been picked.

The mixing conveyor performs two functions—it receives the ¾-in. slack and the 1¾-in. nut from the shaking screens, carrying it to a point located directly over the hinge of the combined picking tables and loading booms and mixing it with the picked lump coal prior to its discharge into the railroad cars, and it removes the refuse picked from the tables, conveying it to a point over the crusher. In order that the two grades of coal shall not be mixed in the conveyor, it is constructed with two partitions.

This conveyor is of the suspended type and has flights at regular intervals mounted on two strands of steel chain with rollers at the articulations. On its return run the conveyor gathers the refuse, picked from the lump coal, from the refuse boxes placed at the sides of the picking tables and discharges it either into the crusher or directly into a refuse bin, where it is disposed of by means of industrial cars that deposit it upon the hillside.

When, however, the boiler house requires fuel, all the refuse is sent through the crusher, from which it passes into a cross conveyor that runs directly over the overhead bin located in front of and above the boilers.

In the event of accident to the machinery in the screen house, provision is made to remove the receiving plates



THE CONVEYOR GALLERY

of the shaking screens, and the slack hoppers act as run-of-mine hoppers, allowing in emergency, run-of-mine coal to be loaded directly onto the inside railroad tracks.

As an additional means of supplying fuel to the boilers a fly gate is provided in the upper shaking screens, so that slack coal may be discharged into the cross conveyor mentioned before.

The combined picking tables and loading booms are constructed of steel corrugated pans mounted on two strands of bushed roller steel strap link-belt. The terminal portion of the loading boom is constructed of a structural steel self-contained frame that is raised and lowered by an electric hoist. This brings the discharge of the coal so close to the bottom of the car as to eliminate breakage.

The cross conveyor for boiler fuel is of the monobar type, with flights spaced at regular intervals traveling in a steel trough fitted with a series of gates that allow the discharge of coal to any of the suspended bins over the boilers.

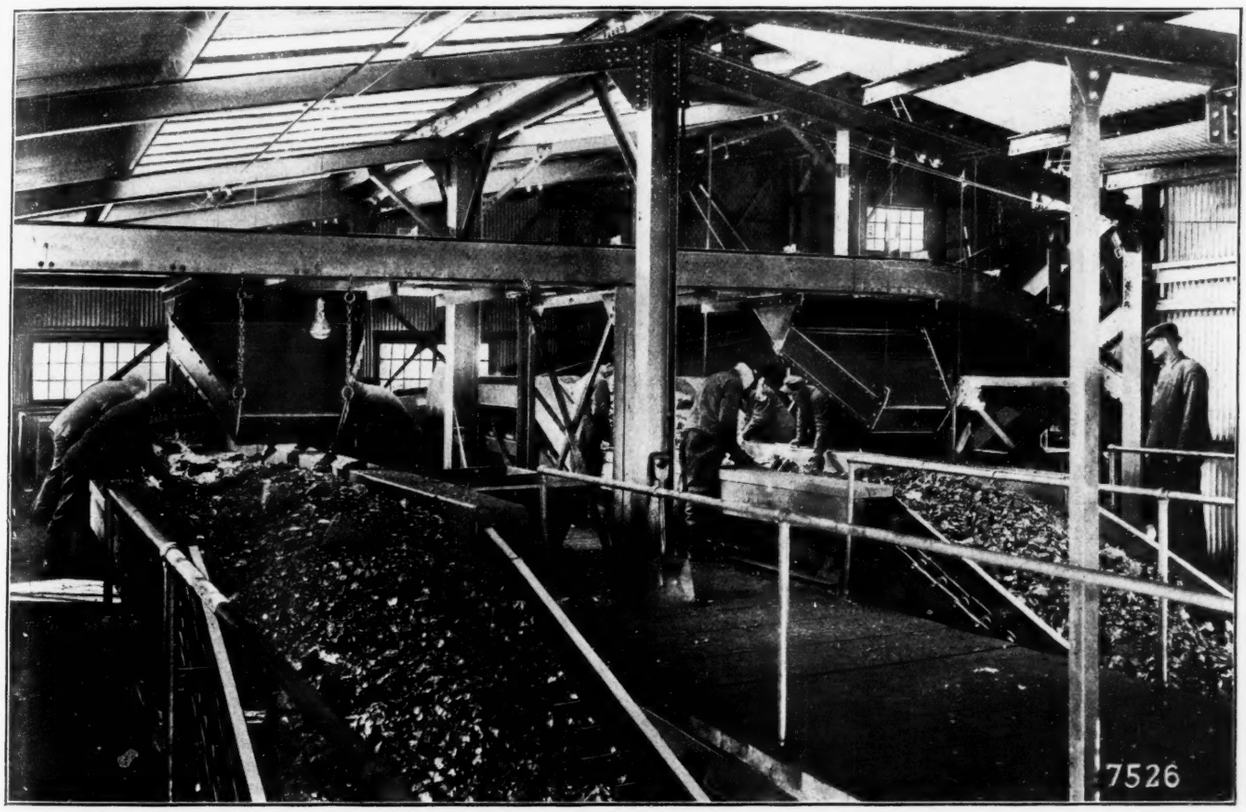
For driving the various units of the operation individual motors are employed, with the exception of the inclined conveyors and the shaking screens, which are driven through cast gears and belts from a common countershaft to the motors. All machines have disk friction clutches and the entire unit can be stopped and started at the discharge end of the picking house, where a lever control can be operated by one attendant.

The boiler house and power plant, which adjoin the screening house of the tipple, were described in *Coal Age* of Dec. 2, 1916, page 928. No further description will be necessary here.

The lower mine is ventilated by a 7-ft. Robinson fan driven by a 150-hp. Crocker-Wheeler motor. The capacity of the fan is 150,000 cu.ft. per min. at a 3-in. water gage.

The "E" vein is ventilated by an 8-ft. Stine disk fan driven by a 40-hp. Crocker-Wheeler induction motor, while the "D" vein is ventilated by a 6-ft. Robinson disk fan driven by a 25-hp. General Electric 250-volt direct-current motor. All the fans have Link-Belt silent chain drives.

The entire screening, loading and handling equipment was designed, fabricated and erected by the Link-Belt Co., of Chicago, Indianapolis and Philadelphia. Fred Norman, chief engineer of the mining company, assisted by J. R. Herbert, is responsible for the splendid arrangement of the yard system behind the tipple.



COMBINED PICKING TABLES AND LOADING BOOMS

Low-Temperature Carbonization Related to Briquetting—The briquetting industry profited in 1916 by the renewed activity in research work on the carbonization of fuels by low-temperature distillation, as briquetting is a natural concommitant of this process. The activity may be attributed to a combination of causes. The most obvious of these are (a) the growing demand in the Middle Western States for a means of converting the high-volatile coals there produced into a smokeless domestic fuel; (b) the necessity of making lignites weatherprooof; and (c) the shortage and consequent high price of coal-tar products, especially creosote oils, on account of the European War. The mechanical problems incident to lignite treatment are still being worked out in the Northern Briquetting Co.'s plant at Minot, N. D., and the American Coal Refining Co.'s plant at Denver, Colo., which were built to carbonize and briquette lignite. At Chicago, Urbana, Detroit, Newark and elsewhere experimental plants have been established. The reports from these investigations are encouraging.—C. T. Malcolmson.

The Symms Method of Timbering

By Wesley S. Harris*

SYNOPSIS—Timbering set in the manner described is particularly adapted to thin coal beds. A plank bent upward in the form of an arch will support a much greater weight than if set as a beam. The spandrel openings are filled with any suitable material to equalize the pressure over the entire length of the plank.

A method of timbering entries and other narrow work, which is believed to be an innovation in means for underground support, has been undergoing a test at the No. 7 mine of the Vigo Mining Co., located at Gilmour, Ind., for the past year. The plan has proved a success and will no doubt result in radical changes being made in the present methods of timbering narrow work in thin, flat coal beds. The scheme is a step forward in the progress of the coal industry, and should be of especial interest to mining men, since it affords a means of reducing costs and minimizing danger.

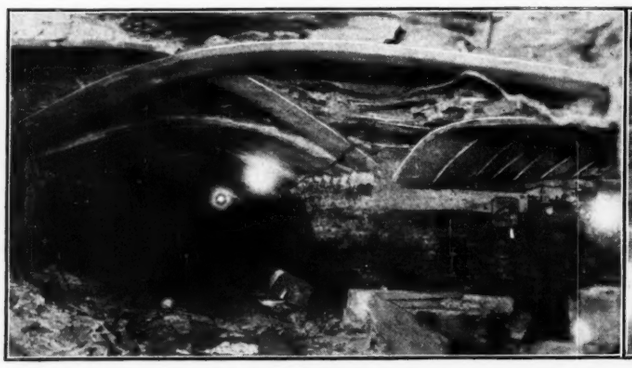


FIG. 1. INTERSECTION OF ENTRY AND BREAKTHROUGH

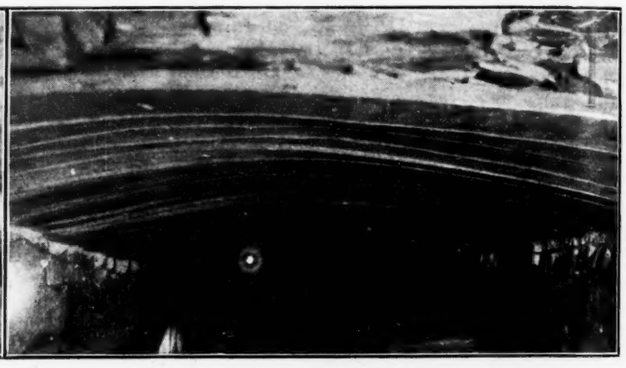


FIG. 2. ROOF OF PUMP ROOM SUPPORTED BY ARCHED TIMBERING

The idea originated in the brain of Arthur Symms, of Linton, Ind., who at the time of the test installation was retained by the Vandalia Coal Co., agent for the Vigo Mining Co., as an efficiency engineer. It is therefore known as the Symms method of timbering. Mr. Symms, strange to relate, is not a mining man in the true sense of the term. He probably never entered a mine a score of times previously to undertaking to put in the test installation.

FIG. 3. ARCHED TIMBER IN AN ENTRY

The idea was the direct outcome of an accident witnessed by Mr. Symms in which a man was injured through a car leaving the track and knocking a leg from under a crossbar. That it was also the result of serious thought is evidenced by the fact that the inventor suggested other expedients as a means of avoiding such accidents before the Symms method of timbering was finally evolved.

The basic principle is an old one, consisting of a curved support in the form of an arch, constructed of boards of the required width and length and with a minimum thickness for a given width of entry. Mr. Symms reasoned that a board 1-in. thick forming an arch under a load would have its entire cross-section in compression and would therefore support a weight equal to a bar or beam of the same material six to nine times its thickness. This is by reason of the fact that only a small part of the bar or beam above the neutral axis would be in compression, while all that portion below it would be in tension.

After conceiving the idea, it was only necessary to apply the principle by placing the boards in the form of an arch with the crown touching the roof and the skewback against the ribs of the entry a few inches below the roof line. The spandrel openings, or cavities formed between the crown of the arch and the two ribs were then filled with any waste material at hand, in order to equalize the pressure over the entire arch.

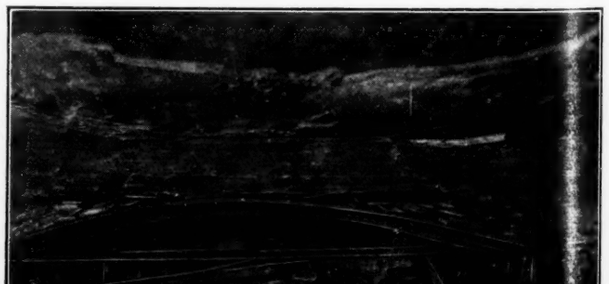


FIG. 4. TWO ARCHED BOARDS AT THE END OF A BREAKTHROUGH

*Superintendent, Vigo Mining Co., Linton, Ind.

The accompanying photographs show a portion of the test installation after it had been in place one year. This test installation consists of 130 one-inch oak boards from 8 to 12 in. wide, located 1 mi. from the hoisting shaft and, at the time of the installation, within 200 ft. of the face of the entries in which they are located. They were put up by two men who had had no previous experience in mine timbering and under the direct supervision of Mr. Symms.

After one year, 100 per cent. of the installation is in the same position in which it was originally placed. Al-

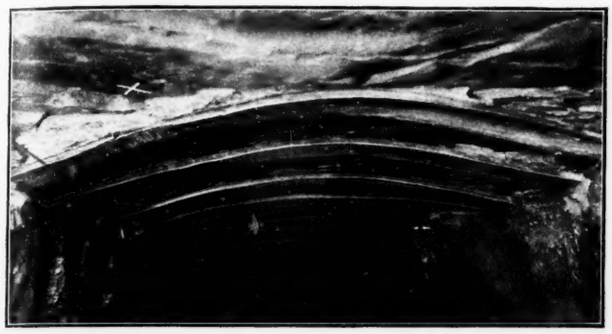


FIG. 5. BOARDS EVERY 4 FT. ON A HAULAGE ROAD

though some of the boards are broken, due for the most part to defects in the material, they are nevertheless efficient as roof supports. The entire installation is apparently in a much better state of preservation than are near-by crossbars more recently placed.

Fig. 1 shows a section of an entry and breakthrough with an X-brace construction, the boards having been placed diagonally across the entry opposite the breakthrough, which is used as an approach to an escape shaft. Fig. 2 is a view in a timbered pumproom. Fig. 3 shows how the shale roof has fallen in a section of an entry just back of the roof support and how it has abruptly broken off at the support itself.

Fig. 4 shows the results of two arched boards placed across the end of a breakthrough. These have held the shale roof in the breakthrough intact, although the entry has since fallen 15 in. high. Fig. 5 shows single boards spaced approximately 4 ft. apart over a haulage road. The board nearest the X on the roof has been almost cut in two by coal on loaded cars dragging against it, yet it is still a substantial roof support. The timbering shown in Figs. 1 to 4 inclusive is on the intake air course, while that shown in Fig. 5 is on the return.

The advantages of this method of timbering are manifest. The most notable are probably the increased available space afforded and the fact that it is often possible to timber without the necessity of removing roof or waiting for it to fall, with its resulting labor expense, in order to secure additional headroom. The cost of timber is materially reduced. Especially is this true where legs are used to support crossbars. Furthermore, the possibility of accidents resulting from the legs being knocked out is entirely eliminated. Then, too, the saving effected in the amount of labor required to place this timbering as compared with other methods should prove to be no small item.

The Vandalia Coal Co., being satisfied with the test it has made and realizing the advantages resulting from this method of timbering, is preparing to install it on a more extensive scale. As the best of native timber is subject to rapid decay when placed in the mine, where conditions are anything but favorable, Louisana red cypress is being purchased at more than double the cost of native material, with the confident expectation that its relative durability will justify the increased expenditure.

Temporary Sinking Layout and Design of Steel Shaft Lining at Lehigh, Mont.

By D. J. Jenkins*

SYNOPSIS—At this shaft work usually considered temporary was performed in a thorough manner so that repairs might be minimized. Several plans for a shaft lining were considered before one was finally adopted.

The Lehigh Mine is located in the Judith Basin, known as "the great wheat belt of the West," in Fergus County, Montana. This plant is under the management of James Pearson and is owned and operated by the Cottonwood Coal Co., a subsidiary of the Great Northern R.R. It lies 75 mi. southeast of Great Falls, Mont., on the Billings & Northern R.R.

For the past 15 years, drilling and exploration work have been carried on in this field to ascertain the extent of the coal bed as well as the quality and character of the deposit. Several openings have been made, including a shaft sunk to a depth of 500 ft. Headings were driven from this shaft, but the opening was soon abandoned, owing to its size, which was too small to be of any commercial value. Subsequently, however, this opening proved to be exceedingly important in determining the size of the development to follow.

The new opening is located approximately 1 mi. east of the abandoned shaft and at an elevation of 4500 ft. above sea level. The plant site was well located for outside operations and is accessible to the main line of the railroad. A temporary track was constructed from the main line to the shaft location for hauling material.

The temporary equipment for shaft sinking was installed in a substantial manner, in order to minimize repair work, which is generally heavy in temporary operations. All the machinery and boilers were placed on concrete foundations.

Steam was generated by three locomotive boilers, carrying 60-lb. working pressure. The two large boilers were rated at 125 hp., with a grate area of 30 sq.ft., while the small one was rated at 60 hp., with a grate area of 20 sq.ft. The feed water was obtained from a reservoir situated 400 yd. from the boiler room and at such an elevation

*Fairfield, Ala.

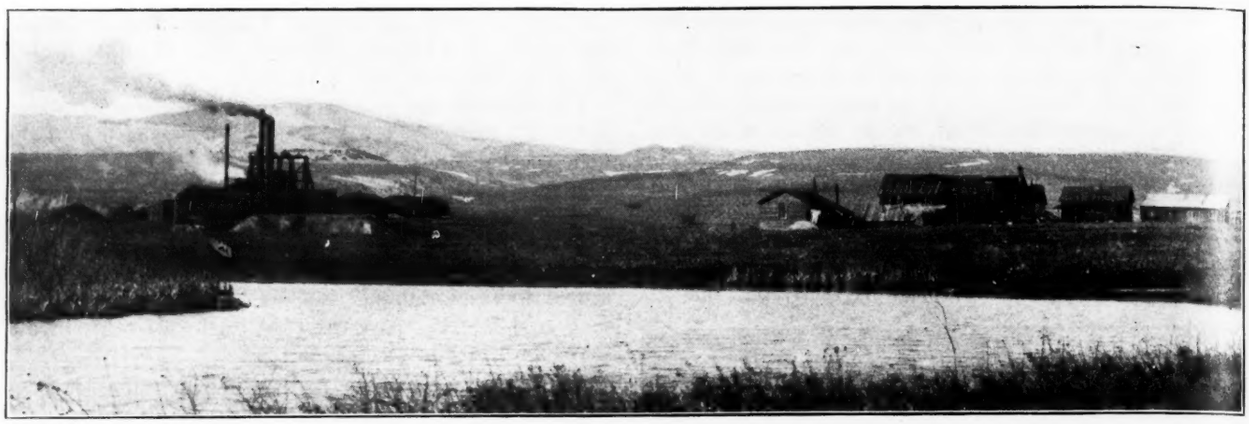


FIG. 1. LEHIGH MINE DURING SINKING OPERATIONS

that the water flowed by gravity through a 4-in. line to an open heater. The ashes were removed by a small tram-car and were dumped in the draws near the boiler house. Steam was used in the engines and pumps, and also for heating the sleeping quarters of the men.

The engine room was 60 ft. from the shaft and adjacent to the boiler room. Two small second-motion engines were used for hoisting the rock and dirt from the shaft. The air for the Jackhamer drills was furnished by a

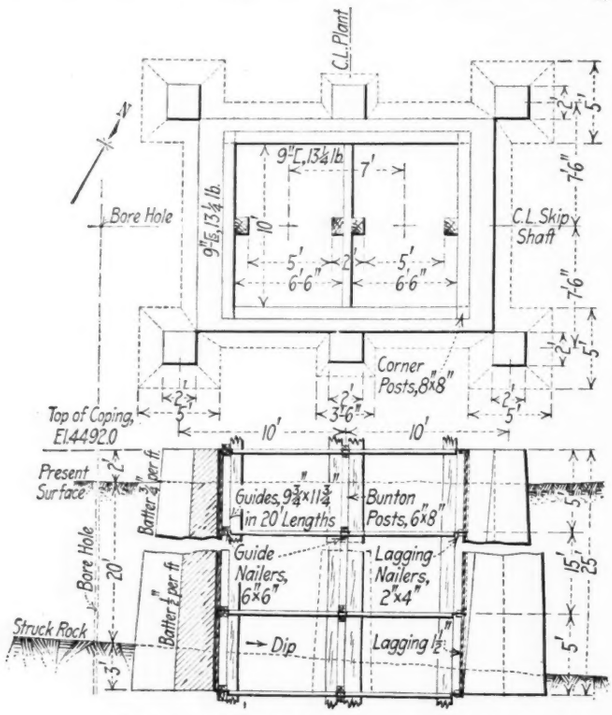


FIG. 2. FIRST PLAN OF THE SHAFT

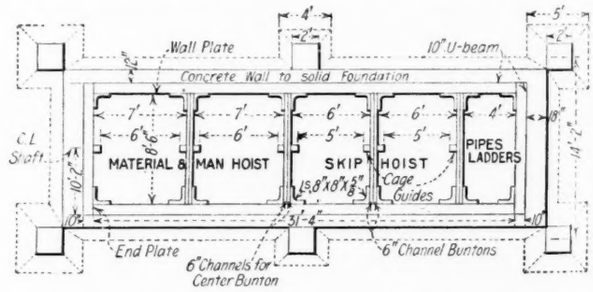
small Norwalk compressor. One small dynamo was installed for lighting the houses and plant. It was also used to fire the shots in the bottom.

After being hoisted in buckets, the rock from the shaft was dumped into a bin adjoining the headframe. A two-ton self-dumping car was used to dispose of this refuse. This car dropped under the bin, was filled and then hauled up a 10 per cent. incline by a small engine. After the car dumped, it returned to the bin by gravity. All suitable rock was washed and crushed and afterward used for concrete in the shaft.

Several plans and estimates were submitted on the design of the concrete and steelwork for the interior of the new shaft. This was apparently due to the difficulty in definitely determining the size of the opening. However, in the hope that some of these might be of interest, I am showing those submitted and the plan finally approved.

Fig. 2 shows the plan and elevation of the first layout. This shaft was divided into two compartments. Each compartment was 6 ft 6 in. by 10 ft. The wall and end plates were 9-in. channels, while the center plate was a 6-in. channel. The lagging and buntons were fastened to the plates as indicated in the drawing.

Figs. 3 and 4 show the plan and detail of a five-compartment shaft. The two large openings are the man and material hoists. This arrangement was deemed necessary, in order not to interfere with the hoisting of coal. The two next smaller openings were to be used for skips. The small opening was for pipe and ladders. This design



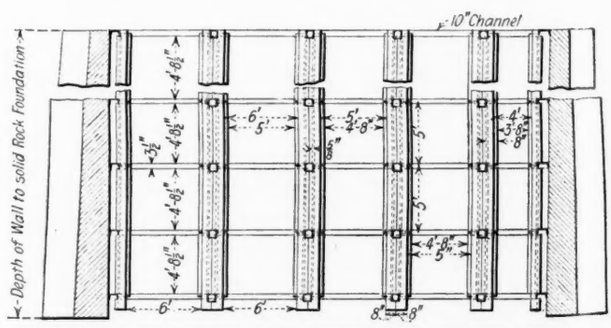


FIG. 3. FIRST PLAN OF FIREPROOF SHAFT LINING

was fireproof and constructed of concrete and steel from top to bottom. The wall and end plates were 8-in. H-sections, fastened at the four corners by an angle plate. Each set was 5 ft. in height and supported by vertical

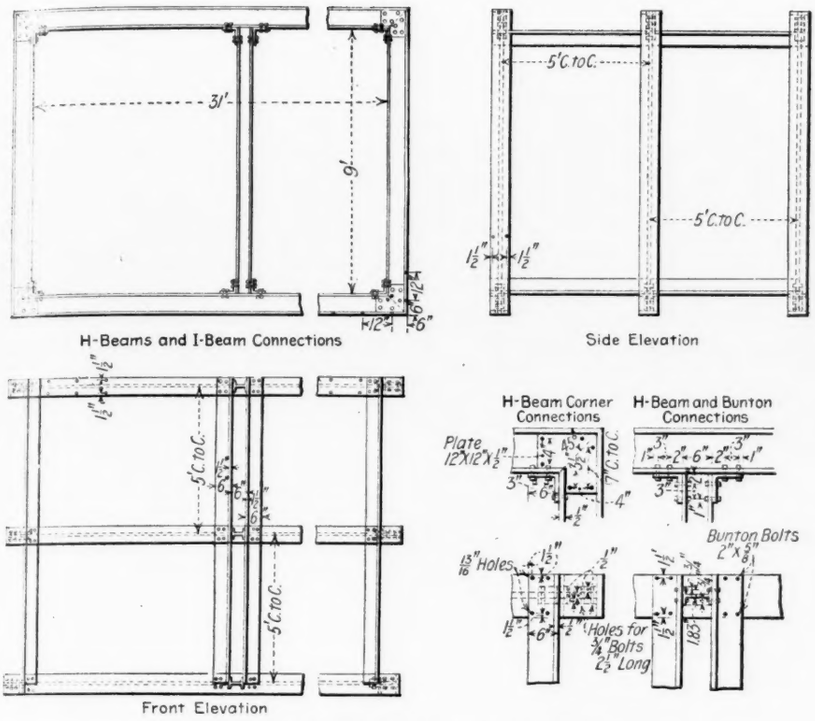


FIG. 4. DETAILS OF SHAFT TIMBERING

angles. These were used for buntons and center posts. From the point of solid rock to the bottom the lagging was sheet steel.

Fig. 5 shows a modification of Fig. 3. This plan was accepted. The shaft is 31x9 ft. inside and has five compartments. The arrangement of each compartment was identical with that shown in Fig. 3, with one exception. The pipe and ladderway was shifted to the center. This was of no particular advantage, but made the design appear more symmetrical. The wall and end plates were made of 9-in. channels and were secured to each other by a lip, or ½-in. plate. This plate was riveted to the end plate and extended over the wall plate. The center plates were made of 6-in. channels and were connected to the wall plates in the same manner as the end plates. Each set was 5 ft. high and was comprised of four wall plates, four end plates and eight center plates.

Each set was held rigid by dowel pins, which were ⅞ in. in diameter and 11 in. long. These pins were

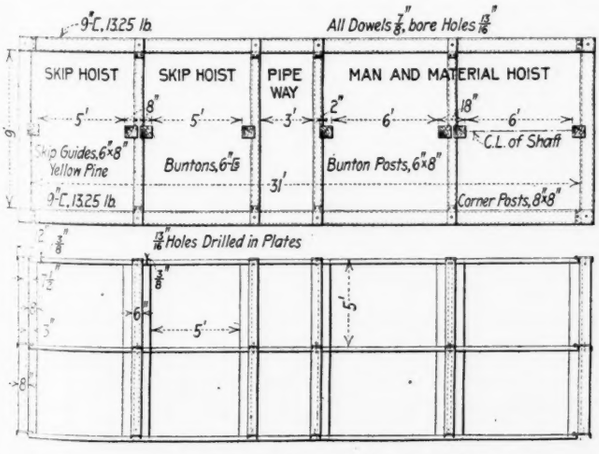


FIG. 5. PLAN OF SHAFT FINALLY ADOPTED

driven in the end of each center and corner bunton. The other end of the pin extended through the wall plate to the adjacent bunton in the vertical; that is, each pin connected two buntons and the wall and end plate in the vertical. The lagging was secured to the wall and end plates by means of an angle bar, which was riveted to each wall and end plate. One-half inch holes were drilled on 12-in. centers in the angle bars through which bolts were passed to the lagging. The lagging was 3x12 in. 4 ft. 11¾ in. long and was creosoted. The guides were 8x8 in. pieces of Oregon fir 20 ft. long. Each guide was fastened to the plates by means of an angle riveted to the plate and held securely by ⅞-in. bolts extending through the guide and bolted to the angle plate.

Progress of Portable Electric Lamps

By Van H. Manning*

At the close of the year 1916 there were approximately 90,000 portable electric lamps in use in the United States, 70,000 of which have been approved for safety and practicability by the Bureau of Mines. This is an increase of about 60,000 over the number in use in 1915, and 75,000 more than the number of lamps in use in the mines of this country during 1914.

At the present time mine operators are purchasing about 2000 approved lamps per week. It is understood, of course, that a suitable number of approved flame safety lamps for gas testing should be used in all mines generating firedamp or blackdamp, but for general use the electric lamp is safer, more convenient and more effective as a source of light.

It is believed that the use of approved portable electric lamps in combination with safety lamps for gas testing has decreased the coal-mine fatalities during the past year, and it is certain that where electric lamps are used men will no longer lose their lives as the result of the ignition of gas pockets or as the result of fires started by open flames, both of which causes have produced many fatalities in the past. It is also probable that the class of accidents which are due to insufficient illumination will be decreased on this account.

Coal Age Indexes Now Ready

Indexes to *Coal Age* are furnished free to all who ask for them. The index for the last half of 1916 can now be obtained by addressing a request for one to the subscription department, *Coal Age*, New York City.

Excessive Recovery for Injury to Arm—A verdict for $10,000 for fractures of an arm of a mine employee in an explosion will be reversed on the ground of gross excessiveness. (Kentucky Court of Appeals, Walcott vs. Indian Creek Coal Co., 182 Southwestern Reporter, 631.)

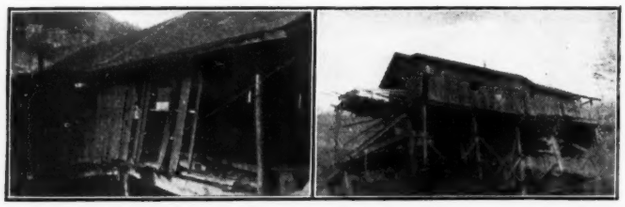
*Director, United States Bureau of Mines, Washington, D. C.

A Pioneer Kentucky Tipple

By H. D. Easton*

The accompanying photographs show one of the oldest tipples in southeastern Kentucky. This is the old Straight Creek, or Barker, tipple of the Federal Coal Co. which has been in constant use for many years.

This tipple is provided with a Phillips crossover dump, a weigh pan and shaking screens with three



ONE OF KENTUCKY'S OLDEST TIPPLES

loading tracks. It has recently been anchored to large trees by ½-in. wire ropes, one of which is shown in one of the photographs.

Much of the coal now being dumped at this tipple has over 7000 ft. of underground haul through worked-out areas of the Straight Creek coal bed. A new development, on Elliott's Branch, will cause this tipple to be abandoned before long.

Recollections of a Mine Manager

Almost invariably when mine superintendents get together the conversation turns sooner or later to ways and means of keeping employees under control. At one of our monthly superintendents' meetings, when the conversation drifted around to that topic, it occurred to me that my superintendents might profit by having their attention called to the fact that there are two sides to that question.

Shortly after assuming the manager's chair, I began to realize that in times past I had not always given my men the consideration they had deserved. This was in no way due to lack of sympathy, but largely because of my one-sided point of view.

A little gossip brought back by my wife from a visit to the mining village that had been our home for so many years first opened my eyes. According to her story, Mrs. Anthony, wife of Buck Anthony, the master mechanic at the mines, was planning to desert her husband and elope with a young commissary clerk who had been boarding with the Anthonys for several years. Recalling Anthony to mind, I remembered that he was the hardest working man on the job; because he didn't mind work and also because he was a monthly man I had always kept him loaded down. On one occasion, while we were having trouble with our pumps, he had remained inside for 30 hr. continuously, and upon other occasions times without number had stuck to his work from 20 to 24 hr. without so much as intimating that he thought he was doing anything out of the ordinary. Undoubtedly, because of these hours spent away from home and family, his wife and the young boarder had been thrown together too much and at last the inevitable had happened, or was about to happen, if the gossips were to be credited.

*General superintendent, Federal Coal Co., Straight Creek, Ky.

Once we get our thoughts traveling in a new direction surprises come thick and fast. A chance remark in a story that may have been picked up to help kill time can set one to thinking and "presto change" the tale is forgotten and we become philosophers. Buck Anthony was not the only employee whose career had suffered in the past because of my actions.

There was John Stewart, the outspoken boss carpenter, who persisted in gossiping with the miners' women folk about the shortcomings of the company whenever he was sent out to make house repairs.

I had found it necessary to reduce the carpenter force in order to find a reasonable excuse for asking for John's resignation, but I did not hesitate for a moment once my suspicions were aroused. I appointed myself the judge and the jury as it were and dismissed him without even giving him a chance to testify in his own behalf. If justification had been required by my conscience, I would have assured myself that the interests of my company demanded such action.

Then there was Tom Martin, the young timekeeper who decided to his own satisfaction that office men were entitled to raises in salary whenever miners were, and proceeded to discuss the matter with his associates so effectively that most of them were brought to Tom's way of thinking. Tom got a raise all right and so did the others. The thing had gone too far before I realized what was up, but Tom soon found himself transferred to another camp, and within a year the job that he held was abolished.

One of the superintendents present asked me if I had known that the job was only temporary. I was almost ashamed to say yes.

Reading Co. Issues a New Circular

The Philadelphia & Reading Coal and Iron Co. has issued a new price circular effective Feb. 1. There will be no change in the prices, but the circular no longer quotes prices for lump, steamboat, broken and buckwheat.

It is difficult just now to discern the significance in the issuing of a circular at this time, even though the several sizes mentioned are dropped from the list. There is never any large tonnage of lump and steamboat sold, and these sizes are never made except on special order. As to broken, there has been a particularly heavy demand for this size, but on account of securing better prices for the coal when broken down into the smaller sizes very few except the larger companies have been making any broken and those companies only on contract orders.

With buckwheat the demand has been extraordinarily heavy and the companies have been in difficulty to supply their contract trade, which was taken at $1.50 last April. They have also been making considerable shipments at the circular price of $1.65. The only explanation seems to be that the new circular is for the purpose of allowing the company to go into the open market and get all it can for broken and buckwheat and in this manner pave the way for increased contract prices on Apr. 1.

The new circular is as follows:

Sizes	Mahanoy and Shenandoah	Locust Mountain and Schuylkill White Ash	Shamokin	Lorberry & Schuylkill Red Ash	Lyk's Valley Red Ash
Egg	$4.15	$4.15	$4.15	$4.35	$4.60
Stove	4.40	4.40	4.40	4.60	5.00
Chestnut	4.50	4.50	4.50	4.60	5.00
Pea	2.80	2.80	2.80	2.90	3.25

Bending Rails with a Portable Hoist

By H. L. Hicks*

The necessity for rail bending is not infrequent in mine-track work, and the usual method of cranking the rails through a rail-bending machine is a slow, back-breaking and sometimes heart-breaking job.

The method of overcoming this condition at the surface plant of one of the Juneau mines is interesting.

THE "LITTLE TUGGER" HOIST USED FOR BENDING RAILS

Fifty-pound steel rails were being bent by hand with a three-wheel bender when the idea of using an air-operated "Little Tugger" hoist to pull them through was conceived. The rail bender was fastened on the track at a point where the curvature was approximately the same as that of the rails to be bent and the "Little Tugger" placed a little more than a rail's length away. A rail was started through the bender and the hoist pulled it the rest of the way. When the radius of curvature was small, it was found advantageous to use a block and tackle to increase the power of the hoist.

When cranking the bending machine by hand, eight men were able to bend but eight rails a day. With the assistance of the "Little Tugger," two men bent six rails per hour, the other six being kept busy carrying rails to and from the machine.

The hoist is bolted to a timber skid, as shown in the illustration. This arrangement is easily anchored in any of the many places where the hoist is used, and at the same time two men can easily carry it about.

*Ingersoll-Rand Co., 11 Broadway, New York.

Outlook of the Coal Market in the Southwestern States

Southern coal operators who have made a careful analysis of the market outlook feel much encouraged over the prospects. Increased competition from natural gas for domestic fuel purposes is expected, however, as more gas wells are constantly being found and pipe lines are being extended to new communities. The price of oil is running high, which is stimulating the drilling of new wells, many of which are gaseous, in view of which the available supply of natural gas will likely increase rather than decline.

The general financial and industrial situation in the Southwestern States is exceedingly good at this time. Even if the European War should be settled, the fact that the Southwest has had an opportunity to liquidate its debts and is now in a sound financial condition, will make that section much less subject to a reaction than the Northern States. The railroads are handling an extraordinarily heavy traffic, consuming large quantities of coal, and all this has a tendency to decrease the amount of coal available for commercial purposes from such fields as McAlester, Henryetta, Coalgate, Arkansas and the New Mexico mines.

No decline has occurred in the use of fuel oil, but since the price of crude oil is ranging considerably higher than in several years, it is not believed that much increased competition will develop during the current year. One probable change is that small sizes like nut and chestnut will move to the steam trade, creating a somewhat wider market for domestic lump sizes. Competition has been strong in the Southwestern States from Alabama and Colorado mines, but since the iron and steel business is now at its maximum capacity, there is a tremendous home demand for those coals.

The exceedingly high prices paid for Southwestern coal this winter, as much as $6 per ton for high-grade McAlester domestic lump, f.o.b. cars at mines, should encourage increased storage of coal during the summer and fall months, which would tend to relieve the excess winter demand.

IN LIGHTER VEIN

Heinrich Came Back

A lot of miners' houses were being constructed in the Pocahontas District, and during the construction work the superintendent on the job, not being pleased with the work of a certain carpenter, sent him a notice of dismissal.

At the end of the week the discharged workman was again seen on the job. "I thought I fired you," said the superintendent, approaching the man. "Chess, sir," answered the German, "You didt; but on der enfelop it says, 'return in five days.'"

The Cost of Ignorance

With so many media and channels through which information on a diversity of topics is disseminated, a lack of knowledge of the condition of the market and the prices ruling on staple commodities spells a sort of business suicide to the uninformed. Yet we are constantly being confronted with individuals who are negligent in taking advantage of these mediums.

As one specific instance, we cite the case of a small coal dealer in Philadelphia who was not aware of the shortage of broken coal. He handled but a limited quantity of this size and had been favored with the shipment of a car by one of the large companies, which is now actually the only one producing this size. The coal was billed at the circular rate of $3.60 per ton.

Not appreciating its value, he allowed a friendly competitor to use most of the coal. When he tried to replace it, the company from which he had received his first car refused to make shipment; so he telephoned all the smaller shippers with which he had done business and was much chagrined to find but one source of relief, and that at $7 per ton.

He is busy now trying to persuade his customers to use egg coal.

An Accounting System for Coal Mines—II*

By R. J. Maxwell†

SYNOPSIS—The second and concluding installment of this article takes up notes and accounts receivable, store and miscellaneous items.

Bank—The balance in this account represents the amount of cash on deposit with the bank, or the amount of overdraft according as to whether the balance is a debit or credit one.

Notes Receivable—The balance in this account represents the amount owing to the company on notes received from the company's debtors and not yet matured.

Accounts Receivable—The balance in this controlling account in the general ledger should equal the accumulated balance of the individual accounts in the customers' ledger. Customers accounts are posted daily from the sales book and at the end of the month the total amount of sales is debited to "Accounts Receivable" controlling account and credited to "Coal Sales" account. Credits to customers' accounts are posted daily from the cash receipts book, and at the end of the month the total of the column "Acounts Receivable" is credited to "Accounts Receivable" controlling account in the general ledger.

Buildings and Equipment—The balance shown in this account represents the cost value of buildings and equipment. When a new building is erected by the company a special account should be opened and cost of same shown in as much detail as the management may desire by means of subsidiary accounts such as "Foundation" (excavation, concrete forms, cement, etc., labor and material) "Brickwork" (labor and material), "Doors and Windows" (labor and material), etc. On completion "Buildings and Equipment" account is charged and the special account credited and closed out. In the case of machinery bought finished, or buildings let out on contract, the invoices would of course be charged direct through the invoice register to the correct account.

Fig. IV.

DAILY TIME REPORT

Date.....

Name	No.	No. of Contract	HOURS		Rate	Amount		Occupation
			Contract	Company				

Mine Supplies, Office Supplies, Rail Account, Lumber, Mine Timber, etc. The balances shown in these accounts represent quantities on hand. They receive their charges mainly through the invoice register and their credits through the material distribution book. Requisitions should be signed only by persons authorized to do so by the management, and no others should be accepted by the supply house man. "Stock Record Cards" (Fig. 10) should be kept at the supply house, giving full particulars of each purchase—where obtained, quantity, price, etc. This record will prove invaluable in future purchases.

Requisitions should be carefully priced from these cards and extended, then turned over to the superintendent for inspection, and by him to chief accountant who looks them over to see that proper accounts are marked for "Dr." and "Cr." and then passed to the distribution clerk who enters them on the material distribution sheet.

It is recommended that balances be struck several times during the month, accumulated totals being inserted in red ink, for the reason that if at the end of the month the debits and credits be found not to agree, it only means checking the last few days' requisitions in order to locate the error or errors, whereas by leaving it to the end of the month it may mean checking the whole month's requisitions.

Fig. V.

MATERIAL REQUISITION

Pocahontas.....191

Storekeeper please supply Acct.		Cost

Foreman.....

The debits and credits being in agreement a journal entry is then made, debiting the various production and other accounts and crediting the inventory accounts, "Mine Supplies," "Mine Timber," etc. If proper care is exercised in issuing, pricing, extending and distributing the requisitions, it will be found that the book inventories produced in the material accounts will not be very far off when actual inventory is taken at the end of the year.

Production Account (Mine Operations)—From the viewpoint of the practical mining man this is the most important account in the general ledger, and as such should receive the utmost care and attention. As shown in the "Chart of Accounts," it is a controlling account the balance in which should equal the accumulated balance of the accounts in the production ledger. These accounts receive their charges mainly through the material and wages distribution. There will be occasional charges through the invoice register for repairs, etc., and a few also through the cash disbursement book.

It has been shown how the requisitions for materials are carried through to the production ledger by means of the distribution and its journal entry. The item of wages from its source to the same point will now be traced.

*From the "Canadian Mining Institute Bulletin."

†Pocahontas, Alberta, Canada.

Each day the timekeeper sends in a time report (Fig. 4) arranged in order of check numbers, showing time spent by each man. In the case of men engaged on company work such as timber packers, drivers, chute loaders, etc., there is shown the number of hours, rate and extension and class of work accomplished. In the case of men on contract work the contract number and number of hours only is shown. The extensions for company workers are added up and total inserted.

The report is then sent to the superintendent for inspection and signature and passed to the pay-roll clerk. At the beginning of each pay period, an individual pay sheet (Fig. 7) is made out for each man on the pay roll, and to these sheets is transcribed each day from the timekeeper's report the number of hours worked and their extension, and in the case of contract workers, the number of contract and hours worked on same. This sheet also shows the deductions for store, rent, hospital, etc., and, in short, is a complete record of each man's account for the period.

The hours worked on contract are then transcribed to the contract sheet (Fig. 6) according to contract number. At the end of the pay period the measurements for each contract are turned in by the mine manager or pit boss and the value of the same divided among the workers on the basis of hours worked. The resultant figures are then transcribed to the individual pay sheets, and when all deductions are inserted, the pay sheets are ready to be completed and carried into the pay roll (Fig. 8).

The wages distribution is composed of four divisions; namely, contract labor, mine labor, outside labor and salaries. Mine labor and outside labor are distributed each day from the daily time report and contract labor and salaries at the end of the pay period. Salaries can be distributed daily if required, but as a rule this is not found necessary. In distributing the mine labor and outside labor the amounts charged against the various classes of work are drawn off on scratch pad, and the totals obtained for each class of work then transcribed to the distribution sheet. At the left-hand side of this sheet appears the date, then the total wages for the day, followed by the amounts for different classes of work.

The figures are cross-checked and then you have the satisfaction of knowing not only that your labor is distributed up to date, but that at the end of the period your distribution will balance with the pay roll to a penny. An hour or so at the end of the period will suffice to distribute the contract labor and salaries and insert in the distribution book. The distribution of the four divisions of labor is then summarized on a sheet of foolscap headed as follows:

Account Name	Mine Labor	Contract Labor	Outside Labor	Salaries	Gross Totals

and journalized as follows: Tipple Expense—Weighman, tipplemen, cleaning coal, box car loaders. Stable Expense—Labor, etc.; to Accrued Wages. The sheet is then filed for future reference.

When all postings have been made to production ledger and totals charged to the controlling account "Production," a trial balance is made of the production ledger and if found to agree with the controlling account the figures are then ready to be drawn off onto the monthly cost sheet, and the actual average cost per ton for the month obtained.

Many companies operate a general store for the accommodation of their employees. The balance shown in this

CONTRACT NO. .. FIG. VI. MONTH OF. ....

COAL						SUPPLIES					
								TOTAL DEDUCTIONS			
MEASUREMENTS											
								GROSS VALUE			
								DEDUCTIONS			
								NET VALUE			

Ck. No.	NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total

FIG. VII.

INDIVIDUAL PAY SHEET

Name.....No.....
Occupation.....Month.....

Date	CONTRACT No.	CONTRACT Hours	COMPANY WORK Hours	COMPANY WORK Rate	COMPANY WORK Amount	REMARKS
1						
2						
3						
4						
5						
6						DEDUCTIONS
7						Overdraft from last month
8						Board
9						Store
10						Supplies
11						Coal
12						Rent
13						Light
14						Hospital
15						Collections
						Smithing
						Checkweighman
TOTALS						Washhouse
Contract No.						W. I. Club
						Advance
						School Tax
TOTAL DUE						

account should represent the value of the merchandise on hand at the end of the period. As a matter of fact, it only does so when actual inventory is taken. It is impossible to determine the profit or loss on the operations of a general store without taking actual inventory or installing an elaborate and expensive system of keeping track of the profit or loss on each article sold. The management of the company with which I am connected is satisfied with obtaining this information three times a year by actual inventory—twice during the year and again at the end of the fiscal period.

It is unnecessary to go deeply into the subject as it does not greatly concern the matter in hand, but a brief description of the accounting operations may not be amiss. Incoming invoices are checked and O.K.'d by the store manager and turned in to the office where they are vouchered and passed through the invoice register, charging "Store" account and crediting the seller. The cash taken over the counter each day is turned in to the office the following morning and entered in the cash receipts book, crediting "Store" account. At the end of the pay period a list of the balances in the charge accounts is turned in to the office, charges against employees being entered on the individual pay sheets, a journal entry being made for charges to outsiders, crediting "Store" account.

Books of coupons good for trade at the store are given to those employees with whom it is not desirable to open charge accounts. When a coupon book is given out it is immediately charged on the man's pay sheet, "Store Coupon Account," being ultimately credited through the pay roll. Coupons used in trade are turned in by the store each day along with the cash, and "Store Coupon Account" is debited and "Store Account" credited, the coupons being destroyed after checking the amounts. Coupons are not accepted if detached from the book, thus removing the possibility of their being used a second time.

The balance shown in the "Store Coupon Accounts" represents the company's liability for outstanding coupons. As stated before, actual inventory is taken at the end of every four months, "Store Account" is debited with the difference between the ledger balance and the inventory amount, and profit and loss credited, this entry being reversed in the case of a loss.

MISCELLANEOUS ITEMS

Suspense Accounts—The balances shown in these accounts represent the unexpired portion of fire insurance, rentals, and such other items as are paid in advance and prorated to expense, and are therefore shown as assets on the balance sheet.

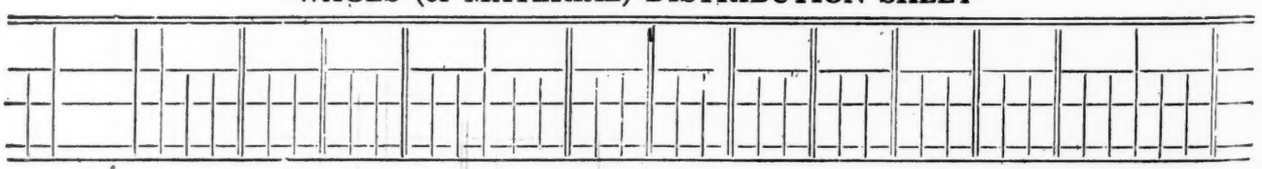
Miscellaneous Assets—This term covers such asset accounts as are not specified above; it will include timber limits, mining rights, wages paid in advance, etc., and represents balances shown in those accounts.

Notes Payable—The balance in this account represents amount owing on outstanding notes given by the company.

Accounts Payable—The balanee in this controlling account should equal the accumulated balance of the accounts in the purchase ledger, and shows the total indebtedness of the company to purchase creditors. It

FIG. IX

WAGES (or MATERIAL) DISTRIBUTION SHEET



Reverse side of Fig. IX

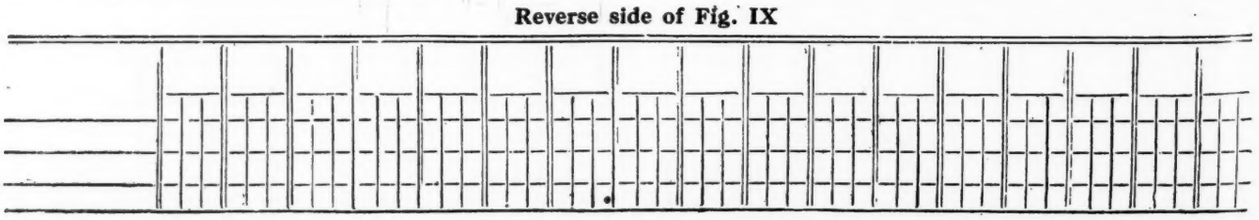


FIG. VIII.

PAY ROLL Month Ending .....191..

No.	Name	DEDUCTIONS																Total Due	Net Amount	Check No.	Overdraft
		Forward Overdraft	Board	Store	Supplies	Coal	Rent	Hospital	Collections	Smithing	Ck. Weighman			Advance	Ck. No.	Total Deductions					

receives its credits mainly through the invoice register and its debits mainly through the cash disbursements book. Incoming invoices are sent to the purchasing department where they are checked for prices, calculations, additions and accounts to be charged, and then forwarded to the accounting department, where vouchers are made for the invoices from each firm and entered in the invoice register, crediting sellers' accounts and debiting the accounts as marked by the purchasing department.

Vouchers are numbered and filed in numerical order. When posting, the voucher number is recorded in the seller's account for easy reference. Each sheet in the invoice register is totaled separately and posted as soon after totaling as may be convenient, the total shown in the column "Cr. Accounts Payable," being credited to "Accounts Payable Controlling Account."

Accrued Wages and Salaries—The balance in this account represents the amount owing by the company to its employees for wages earned and unpaid. When the pay roll is compiled from the individual pay sheets, a summary will show the gross wages, the amount of the deductions and the net amount to be paid. This account is credited with the amount of the gross wages by means of the journal entry made from the wages distribution as explained before, and debited with the amount of the check drawn for the net amount to be paid.

A journal entry is also made debiting this account with the amount of the deductions, crediting the various accounts of store, rent, hospital, etc. If wages were paid right up to date at the end of the pay period, the account would close out, the deductions plus the net amount to be paid being of course equivalent to the amount of gross wages. However, as in accordance with the Alberta Mines Act, two weeks are permitted to elapse between the last day of the pay period and the date of actual payment, there will always show in this account a credit balance representing the amount of wages accrued during the current half month. In other words, the credit balance shown in Accrued Wages account at the end of each month should equal exactly the net amount to be paid as shown by the pay roll for the last half of the month.

Reserve Accounts—The balances shown in these accounts represent the amounts put aside from time to time out of the profits for the purpose of meeting expenditures which experience has shown will certainly occur at some

FIG. X.

STOCK AND PURCHASE RECORD

Article..... Size ..... Unit. .....

LOCATION

Aisle... .....
Section... .....
Bin.. .....

PURCHASE RECORD							STOCK RECORD				
Date Ordered	Order No.	From whom Purchased	Quantity	Invoice Amount	Freight	Cost per Unit	Date	Rec'd	Issued	Req'n No.	Balance on hand

future date, such as replacement of worn-out buildings and machinery; also, to meet such items as are paid arrears, for example, taxes; and to write off such accounts as mine development, mining rights, etc.

Charging Off Depreciation

The rate at which different buildings and machinery depreciate has been very closely determined by long experience, and we are consequently enabled to charge each year's production with its true proportion of the expense of replacements. There are several methods of applying depreciation to the cost of production, the two principal ones followed being (1) by a fixed amount per ton and (2) by writing off a fixed sum each month based on the life of the building or machine. The chief advantage of the first method would appear to be in the fact that the amount written off for depreciation each year varies with the production and consequently in lean years the Profit and Loss account is treated somewhat more kindly than would be the case in the second method. However, I believe the second method to be the safer one, as the rate of depreciation is practically the same each year whether the production is high or low.

Miscellaneous Liabilities—The balances in these accounts represent our liability for such things as outstanding store coupons, unclaimed wages, and amounts collected for persons running boarding houses.

Profit and Loss—This account is credited, at desired periods, with the revenue derived from the sale of coal, together with such revenues as rent of cottages, store, profits discounts received, etc., and is charged with the balance shown in "Production Account" and such items of expense as do not come within the scope of mining operations, for instance, advertising and selling expenses, discounts paid, etc. At the end of the year this account is closed out into "Surplus Account."

Capital Stock—The balance in this account represents the indebtness of the company to stockholders for amount of stock subscribed.

Surplus—A credit balance in this account represents the amount of undivided profits available for dividends. A debit balance would mean an impairment of the assets of the company.

In conclusion it will be seen from the foregoing how the cost accounts are correlated with the general books of account by means of wage and material distributions and consequent journal entries; that book inventories are produced in the inventory accounts which will closely approximate to those obtained by actual inventory; and that when the books are closed and a trial balance drawn off, a monthly balance sheet and profit and loss statement can be obtained.

Secrecy in Ocean Shipping

Three shipping agencies in Baltimore have taken action to prevent the giving out of information by the Baltimore Custom House of the amount of export coal cargoes leaving that port. These firms are the Terminal Shipping Co., the Johnston Line and the Robert Ramsay Co., and they control practically all the important bottoms carrying export coal from Baltimore. They announce that this action was taken to prevent what they term "enemy information" from being disseminated during these days of submarine activity and raiders.

The law provides that information as to the nature of a cargo cleared or its amount should be refused by the Custom House when the shippers or vessel agents demand secrecy. The complaining companies also demand that all information pertaining to the clearance of their vessels from Baltimore be refused, even to the Baltimore Maritime Exchange, but this claim was not allowed, as the law provides that clearances be public, at least as regards the name of the vessel and its destination. Apparently little is accomplished by this secrecy, the only effect being that export statistics are delayed. It would seem that the records should either be completely open or, if the need were sufficient, closed entirely. Other ports make the records public, and it is only the three shippers at Baltimore who are withholding the information.

The Conundrum of the Power Plant*

By Berton Braley

(With apologies to Kipling)

When the smooth-tongued salesman comes around with his talk of some new device,
Which he says is the niftiest thing on earth and worthy of twice its price,
He may be telling the gospel truth as clear as the light of day,
But the wise man mutters behind his hand, "It looks good, but will it pay?"

For the test of a grate, a metering device or recorder of CO_2
Is never its looks or the salesman's talk, but rather what it will do;
So the wise man gazes at plots and prints and hears what the salesmen say,
But quietly figures the costs and sighs, "It looks good, but will it pay?"

Or the man from the central station comes, and a plausible chap is he,
And he wraps himself in a mist of words like a roseate rhapsody;
He would junk your plant, and he'd sign you up on a contract right away,
But the wise man murmurs in accents low, "It looks good, but will it pay?"

Efficiency experts dope things out on the latest and smartest plan,
They count the strokes of each piston rod and the motions of every man;
And they're frequently right in their scheme of things and the logic that they display,
But the wise man nevertheless exclaims, "It looks good, but will it pay?"

Now there's room for progress in every plant, and the mossback's just a fool,
And the man who balks at the thought of change is worse than a stubborn mule;
But the "show me" chap has the right idea and never goes far astray
When he puts each change to the acid test—"It looks good, but will it pay?"

*Reprinted from 'Power."

The Labor Situation

General Labor Review

The International Executive Board concluded its sessions on Jan. 20, and on Jan. 22 the newly formed "Organization Committee" established at this meeting made a statement to the members of the union. It says that the members of the committee are Frank J. Hayes, John Zimmerman, Andrew Watkins, W. D. Van Horn and Robert H. Harlin, John P. White being an ex-officio member. It declares that hereafter areas that are not able to support a strong union will be under the control of this committee until able to sustain themselves.

It also states that the control exercised in West Virginia during the past year proves the ability of a central committee to handle unions in embryo. Finally, it asserts that the decision as to the point to be attacked by the organization committee must be left to its judgment. Otherwise, in the future as in the past, the public will be apprised as to the area about to be entered for proselytic action, and the operators will prepare to prevent the success of the project.

As Usual, Button Strikes Must Be Recorded

As a whole the anthracite miners are working steadily, though the latent possibilities of trouble that still exist are foreshadowed in the strike at the Good Spring and North Franklin collieries in the west end of Schuylkill County, which occurred on Jan. 23 and 25 respectively. It was the usual button strike. About 1800 men were thrown idle. Brookside colliery in the same district followed suit, making a total of 3200 men. These mines all belong to the Philadelphia & Reading Coal and Iron Co.

The union's experience in trying to enforce its agreements on the miners of the anthracite region is not encouraging the officials to persevere in attempts of this kind. It seems to be only able to use "moral suasion." It is not a "league to enforce peace," but merely one to seek it; and sometimes the union officials wonder if it is safe and sane to do even that, for the path of the pacificator is not always smooth. The union suspended three locals at Shenandoah for striking in violation of the agreement with the operators.

White Finds It Hard To Discipline Locals

The suspension was made at the spur of the moment. Probably it would not be made today under like circumstances, but John P. White at that time keenly resented the suggestion that the new contract only bound one party, the operators, and so when the Shenadoah locals proved the operators' contention so inopportunely, he was quite wrath and took appropriate action—action which, appropriate as it was, could not but bring the officials of the union into trouble. The president of the union has been more prudent and less given to righteous indignation since the Shenandoah locals put the matter into the hands of the courts.

The union has appointed a committee from the international executive board, consisting of Martin A. Nash, of Pottsville; N. J. Ferry, of Hazleton, and Thomas Davis, of Nanticoke, to sit as a court and decide the matter. The case is very clearly against the locals and in favor of the executive officials, but it is almost hopeless to expect that the court will not let its mind wander to several other strikes which have not been visited with any such drastic action. Why the very button strikes just mentioned should be punished by the union with the suspension of the offending locals if the unions would be consistent and are really anxious to see their agreements observed!

The mines in the Panther Creek Valley, which belong to the Lehigh Coal and Navigation Co., are now working 8 hr. on Saturday instead of shutting down at noon. The change in plan occurred on Jan. 27. The company submitted the question to the mine workers and the decision to work 48 hr. a week instead of 45 was carried by a large majority.

In the Pittsburgh district no important change has taken place during the week. A three days' strike at one plant, to secure wages in excess of the existing contract, is the one exception. This took place at the Hazel mine of the Midvale Steel Co., near Canonsburg, Washington County, which is a union mine. The district officials of the United Mine Workers forced these men back to work at the contract prices. Most of the recent union agitation has originated near Canonsburg.

The movement that has been started to induce some of the local unions to withdraw from the United Mine Workers of America and demand higher wages seems to have been dropped.

The car supply in both the Pittsburgh and Somerset County coal fields has been worse than ever during the past week. Added to this has been a seeming inability on the part of the railroads to promptly move the cars from the mines to destination.

The heavy snowfall, followed by copious melting rains during the day and night of Sunday, Jan. 20, caused the rivers to rise to such an extent as to prevent river loading during the first half of the last week, the result being that mines along the rivers that depended on river loading when railroad cars were not to be had lost much time. The water was over the streets of several of the river towns. The flood caused washouts on some of the railroads, thus further hampering the operation of the mines. Many of the furnaces were forced to bank for a few days during the early part of last week, owing to the shortage of cars at the coke ovens and to the inability of the railroads to move what coke was loaded.

Byproduct Coke Works Have a Short Strike

The coke workers of the Semet Solvay plants at the newly acquired Lebanon and Cornwall iron and steel interests of the Bethlehem Steel Co. struck on Jan. 23 because no bonus had been granted. The coke plant was operated by the Semet-Solvay Co., but was to be turned over to the steel company on Feb. 1. The men claimed that the former corporation had promised to pay them a bonus for their work in 1916 and had failed to do as agreed.

The strike so crippled the steel company that on Jan. 26 it took over the plants before the agreed time. The strikers immediately returned to work. State representatives had vainly sought to produce this result by conciliation, but the men would not be persuaded so long as the Semet-Solvay Co. controlled the plant. The suspension caused two local furnaces to be banked and threatened operations at the Bird Coleman and North Cornwall furnaces. If the strike had continued, the output of the Cornwall ore mines and of the mills of the American Iron and Steel Co. would have been seriously reduced.

Big efforts are being made to unionize the Maryland coal field, Van Bittner, former president of the Pittsburgh district (No. 5) aiding in that work.

In Illinois a strike has occurred at the New Staunton Coal Co.'s mine at Livingston. That at the Nokomis mine still continues. The drivers are demanding 9-hr. pay for 8-hr. work, which is contrary to the provisions in the agreement. These two operations are among the largest in the state. Both the company and the mine workers are standing strongly by their contentions, and the strike appears likely to last a long time.

Mine Workers Agitate for New Legislation

The labor leaders of Illinois have been conferring with Governor Frank O. Lowden to urge on him the consolidation of the State Industrial Board with the State Board of Arbitration. This change was first suggested by Victor Olander, the secretary of the Illinois Federation of Labor It has been indorsed by John H. Walker, president of the same organization, and by Frank Farrington, district president of the United Mine Workers of America. It is proposed to increase the membership of the Industrial Board from three to five and intrust it with the duties now performed by the State Board of Arbitration.

The Texas mine workers are also taking an interest in pending legislation. They appeared before the State Mining Board at its meeting at Fort Worth and asked for legislation that, in their belief, will assure them of greater safety. They ask that a law be enacted requiring pure lard oil be used in the lamps worn by mine workers. The mine workers of Texas, strange to say, are opposed to the introduction of the carbide lamp, a form of illumination which the mine workers of other sections agree is a great improvement over the lard-oil torch. The Texas mine workers are beginning to use the carbide lamp, the price of lard being almost prohibitory. Many of them, however, believe the new illuminant introduces a new hazard into the mines.

The mine workers also ask that a law be enacted regulating the firing of shots in the mines. They also desire that all hoisting engineers be required to pass an engineer's examination, that mine inspectors be given police powers and that the openings to escape shafts be placed at least 250 ft. away from any mine building.

It will be remembered that the Bache-Denman interests, of Arkansas, brought a suit against the United Mine Workers of America under the Sherman anti-trust law, the action arising out of the intimidation of workmen and the burning of tipples by mine workers. The United Mine Workers denied that it was suable, but that contention was not accepted by the court.

The mine workers have appealed to the Supreme Court for a review of the decision of the lower tribunal, that the union might be prosecuted, and they also ask for a writ of prohibition against further proceedings in this matter. The companies ask for $1,283,000 damages, three times the amount of the injury sustained, that being a provision of the anti-trust law.

Difficult Powder Problem Settled

On Jan. 27 the mine workers in the employ of the Delaware, Lackawanna & Western Railroad Co. Coal Department made a subsidiary agreement regarding the powder supply at a meeting of the grievance committee with Maj. W. W. Inglis, the manager of the company's coal department.

The company's offer is regarded as quite fair and runs as follows:

In addition to other grades of power the company will keep on hand at all collieries a supply of 40 and 50 per cent. nitroglycerin powder (dynamite). The company will not insist on the use of any powder that will decrease the earnings of the men. When a miner requests a foreman for a supply of a particular grade of powder necessary to do work in his place and there is any disagreement between the said miner and the foreman, the miner shall be supplied with the powder desired until such time as an investigation shall be made, and if the investigation shows the miner to be wrong the proper kind of powder to be used shall then be furnished.

In such investigation the colliery superintendent and the colliery grievance committee, or a practical miner selected by the committee, shall be called in as a third party. During the investigation the miner shall be supplied with the kind of powder desired.

The company at all times reserves the right to say what kind of powder is to be used in its mines, subject to the above understanding.

There seems an endless opportunity for squabbling over these loose provisions. Nothing is said as to the conditions on which the decision of the investigation committee is to be based. The agreement may work unexpectedly well, however, if both parties have the same idea of the conditions under which nitroglycerin may be used. But that was the onus of the contention and it does not appear that the agreement settles it.

Decision Against Contracts for Machine Mining

The decision of Charles P. Neill, the umpire of the Conciliation Board, regarding the right of anthracite companies to make contracts with individuals is as follows:

At several collieries of the Delaware, Lackawanna & Western Railroad Co. there exists a condition whereby contracts have been given to individual miners for mining coal after machines covering sections of certain veins and employing a number of other miners and laborers whose rates said contractors fix. We hold that the letting of such contracts is a violation of the existing agreement between Districts Nos. 1, 7 and 9, representing the anthracite mine workers' organization, parties of the first part, and the anthracite operators, parties of the second part; and that instead of letting the contracts in the manner above mentioned the rates should be fixed by the company in accordance with the machine mining contract of May 5, 1916, whereby all miners and laborers employed should either work by the day for the company or at contract rates fixed by the company in accordance with said contract, and that it is not within the right of the operator to contract with a third party under the terms of the agreement of May 5, 1916.

Company Declares Contract Labor Is Permissible

The formal reply of the respondent company is as follows: "The Delaware, Lackawanna & Western Railroad Co. has several collieries where mining machines are used to undercut the coal under contract, as alleged by complainants' statement. We hold that from the fact that in the contract of May 5, 1916, a base price was provided for the payment of the various employees where mining machines are used, we believe it is entirely within our rights and not a violation of this or any prior agreement to make such contracts and use such methods in the mining of the coal where mining machines are used, that will tend for the best interest of our various operations."

There is probably no dispute over the essential facts in the case as regards the character of the contract entered into with one Jordan; and the question at issue reduces itself to the interpretation or construction to be placed upon the second article in the agreement of May 5, 1916, which governs machine mining. The real question at issue is very fully, very clearly and very forcefully discussed in the briefs filed by the respective sides to the controversy. Realizing from the beginning the importance of the issue involved in this case, the umpire has gone through both briefs repeatedly and has also gone carefully over the transcript of the hearings held by the Board of Conciliation, and other like arguments advanced at the meeting of the umpire with the Conciliation Board. He has been desirous of going fully in this decision into the contentions of both sides and of setting out clearly and adequately the reasoning upon which his decision is based, and he has held up the decision already for some time in the hope that he could find the opportunity of writing out a decision of the kind above suggested. But as this opportunity has not occurred and is not likely to occur in the immediate future, he feels constrained to render the decision without further delay and with only the briefest discussion of the principles involved.

The respondent company in its brief holds that it has "a natural and inherent right" to make such contracts as the complainants in this case are objecting to, unless this right has been "denied expressly or by necessary implication" in the agreement of May 5, 1916.

In the judgment of the umpire the right of the company to make contracts such as the one with Jordan is denied—by "necessary implication"—by the agreement of May 5, 1916.

The second article of that agreement is the only part which is involved in this controversy and covered by this decision. The first sentence of this second article reads as follows:

"Second—Conditions having arisen in portions of the anthracite region necessitating the use of mining machines, the right of the operator to use such machines shall be unquestioned and the method employed shall be at the option of the operator."

Urges That Contracting Is Not a Mining Method

The company contends that this paragraph leaves it absolutely "unrestricted" as to whether it follows the ordinary method of letting the work to individual contract miners or adopts the plan of making contracts such as the one with Jordan and letting him employ the necessary miners and laborers. The complainants hold that the term "method" rereferred to such "methods" as "room and pillar, longwall," etc.

Even if it were conceded that the term "method" was not used in this narrower sense contended for by the complainants, but that it had some broader meaning, it would still not necessarily follow that it was used in the broad "unrestricted sense" contended for by the company. As the umpire reads the agreement, the term "method" cannot be disassociated from the two paragraphs (a) and (b) which follow the one in which it is used.

If the term does not refer to the physical methods of mining, but had relation to the methods of contracting and of payment which are permissible under the contract and which are "at the option of the operator" must be held to be the ones that are outlined in the succeeding paragraphs (a) and (b) and nothing in these succeeding paragraphs of the agreement suggests even remotely a method of contracting such as the one that brought about the presentation of this grievance.

In other words, going on the assumption that the umpire feels is not only fair but is a necessary assumption that the parties to this agreement of May, 1916, were endeavoring to draw up an agreement to cover the various conditions of contract and of payment which were to govern their relations for a period of four years, it must be held that the contract covered all such conditions and that it did not cover certain conditions only and leave entirely open other questions, which each side must have realized would promptly develop friction and serious controversy of the very character that the agreement was entered into for the purpose of preventing.

Under this construction of the contract, it would be the same as if it provided that the methods which are "at the option of the operator" were the methods which are immediately thereafter outlined, and these methods only. Not only do the methods outlined in paragraphs (a) and (b) make no provision for a method of contracting such as the one involved in this case, but, on the contrary, the provisions of the second sentence of section (b), in the judgment of the umpire, necessarily negative such a contention.

This part of section (b) reads as follows:

"Where mining machines replace contract miners cutting coal from the solid, the average daily earnings of the contract machine miners shall not be less than the average normal earnings of such contract miners in the territory where the mining machines are introduced and where the same vein conditions exist; provided, that where the average normal earnings of the contract miners are shown to be less than the day rate established in paragraph (a), the machine contract rates shall be so adjusted as to enable the machine miner, on the average, to earn a daily wage of not less than the day rate established in paragraph (a)."

Cannot See How Miner Can Be Guaranteed

It is very clear that the provision of the agreement here quoted was intended as a guarantee that whenever mining machines were introduced in sections now being mined the new rates fixed and paid to contract miners following the machine should not yield a daily earning less on the average than the daily earnings now being made by contract miners on the existing rates for mining from the solid.

But if contracts such as the contract with Jordan are permitted, then this guarantee to contract miners against reduction in earnings cannot be enforced in practice. At the meeting with the Conciliation Board, in reply to a question by the umpire, it was stated that Jordan was, in effect, a contract miner; and that in figuring average earnings his own earnings as well as those of the miners working under him would be taken together in determining whether contract miners at the new rates of machine mining were earning as much on the average as contract miners in the same section were earning formerly at the rates for mining from the solid.

According to this contention, miners working under a contract such as Jordan's would have no guarantee even that they would not receive less on the average than the $3.30 per day rate. Thus, assume that in a given section the contract

miners mining from the solid were averaging $4 a day, now if machine mining were introduced and contracts such as Jordan's made, and if such a contractor had five miners working under him and they were only earning $3 per day and he were making $9 per day on his contract, the six of them would be earning, in all, $24 per day, or an average of $4 per day each.

If we accept the contention that Jordan is a "contract miner" within the meaning of that term, as used in section (b) of the second article of the agreement of May, 1916, then the provision that earnings of "contract miners" must average as much as under the former rates for mining from the solid has been technically complied with. But it cannot be seriously held that an agreement was made that would permit of its working out such a result. It may be contended that this is not the actual result; but it is an entirely possible result; and the possibility of this result, in the judgment of the umpire, convincingly argues that contracts such as this one of Jordan's were not in contemplation in the making of the 1916 agreement.

In opposition to this contention that a contractor such as Jordan is a "contract miner" within the meaning of section (b) of article 2 is a part of the brief for the respondent company, which seems to hold that Jordan is a "lessee" to whom the operator has "sublet" a portion of his property. Following out this contention the brief continues:

"Clearly the purpose of the contract (that is, the agreement of May 5, 1916) is but to provide a rate of compensation to be paid certain kinds of labor by the employer, whether he happens to operate the whole or any part of the mine.

"Subdivisions (a) and (b) merely provide a compensation for certain methods of mining. They do not even provide that this compensation shall be paid by the operator or in any manner make him responsible for it, unless he contracts for the work."

Operator Is in No Way Responsible for Wages

According to the umpire's understanding of this contention the contract of May 5, 1916, would not apply to Jordan's employees at all, since it seems to be held that the operator is in no way responsible for the rates paid by Jordan.

If this contention were conceded the guarantee against reduction in earnings which section (b) of the agreement of May 5, 1916, contains would be of no value to the men working under these "lessees."

If the contention that a contractor such as Jordan is not a "lessee," but a "contract miner" within the meaning of section (b) is conceded, then, as has already been pointed out, his "profits" go in as a miner's earnings and to that extent defeat the purpose of section (b).

In the judgment of the umpire the whole tenor of section (b), providing for the rate for which contract miners are to work when machines are introduced compels the "necessary implication" that contracts such as Jordan's are not contemplated by the second section of the agreement of May 5, 1916.

The umpire further agrees with the contention of the complainants that this second section of the contract or agreement must be held to be a complete agreement covering the rates and methods of pay of miners doing machine mining; and that contracts or bases of pay that are not therein specifically covered are not permissible under this agreement.

The grievance is therefore sustained.

CHARLES P. NEILL, Umpire.

Well-Established Method Changed by Decision

This decision is remarkable. It declares that the practice of contracting makes impossible the guaranteeing of the minimum wage which the agreement provides, and says that therefore the agreement did not contemplate the practice of contracting. Strange to say, contracting existed before the agreement was made. It must have been in the minds of those making the agreement. The mine workers wanted an agreement which did away with it and repeatedly asked for such an agreement, but it was denied them. They accepted finally one which assured them of a wage equal to that obtainable in places where there was no machine mining. Now, by putting an ex-parte interpretation on the words, the mine workers succeed in upsetting the understanding which they have signed.

It would seem that there were no records kept of the meetings in the McAlpin Hotel. Consequently, it could not be shown that this contracting fight was a leading bone of contention. Surely, if the mine workers were winners in this dispute they might have written it in the contract. They never claimed any such thing, but now they are given the victory by Charles P. Neill, though it was a victory which at the time they did not claim. The operators' representatives on the Conciliation Board will be careful hereafter in the umpires they allow to be chosen.

Miners Really Accepted Contract System

There is no desire in what has been said to misrepresent the facts. The "United Mine Workers' Journal" openly declares that the mine workers have won from Neill what the operators denied them. Says that journal:

This [decision] means that the miners win by an umpire's decision a concession that they have demanded for 17 years and adds a new victory to the list of [those won by] the three representatives from the anthracite region who sat with John P. White in conference with the operators. At that time the operators, while saying that they would use their influence to abolish the contract system, except where it applied to machine mining, refused to put the assurance into writing.

Evidently, therefore, the miners do not claim that there was a verbal understanding doing away with contracts relating to machine mining.

Another View of Somerset Strikes

An organizer in the Somerset field, Michael Nelson by name, objects to the statement appearing in these columns as to the success of the union in the Somerset County field. At no time has a general review been taken of the progress of the union movement in Somerset County. The statements have rather been of its weekly developments. Reference has been made also rather to the progress in unionization than to the increases in wages. However, in fairness, the letter of Mr. Nelson may be quoted with some slight changes:

A few weeks ago you stated that the organizers were doing nothing in the Myersdale field. With that statement I beg to differ. When they came here about September last year the miners were getting from 53 to 58c. per ton, and it was a long ton at that. Today they are getting 70c. a ton. Daymen were getting $2.47 for 10 hr.; today they receive $2.80 for 9 hr. We have agreements with 15 companies and have placed 13 checkweighmen on the tipples of the region.

It may be remarked that there have been large increases in all nonunion fields, due to the urgency of competitive conditions. Nonunion operators have raised wages extensively, trusting, it is said, to their power to reduce them at will after the press of business declines.

Canadian Miners Endeavor To Break Contract a Second Time

The trouble in British Columbia seems to be growing day by day. It does not look as if the miners would be content with an increase of 9½ per cent., which is the percentage that the Government has determined represents the increased cost of living to the mine workers. The miners object particularly to the fact that when the last increase was given they received an advance of only 5 per cent., while the day workers were benefited from 8 to 12½ per cent.

It would seem that this apprehension, however, can easily be allayed by promising an equal increase all around, but the mine operators do not appear willing to make the concession, saying that there is no assurance that the new subsidiary contract would not be broken just as the older contract then would be, and just as the original contract was before it.

It is said the public of Canada regards the operators as lacking in public spirit, but it is hardly fair to assail them. They are confronted with a union that strikes whenever it thinks it can raise wages, regardless of the contracts restraining it, and continually holds out the threat of governmental confiscation.

The operators are trying to arouse feeling against the union by declaring it "an organization controlled by foreigners, not having the interests of the country at heart, possibly animated by feelings the very reverse." It is of course a foreign organization, but the Canadians in justice must admit that in this present trouble the international board is advocating peace and submission to contracts, and that the trouble is wholly due to the disposition of Canadian workmen, who strike whenever they think a good chance for an advance in wages offers.

There is evidence that John P. White is anxious to see the Canadian workmen respect their contract. However, as has been pointed out in these columns, he is not as aggressive in the defense of the contract as he would be were he a native of Canada. He would also have felt more bound to support the contract had he himself actively taken part in its framing and made the inevitable declarations at the time that it would be observed and that he would act to maintain that observance.

The operators, moreover, do not like the idea of entering into a contract which will last only till Mar. 31. If the new arrangement could be made for a term of years, they would be willing probably to accept it; but they object to its life being limited to the short period during which the still-running but extensively modified contract of Mar. 31, 1915, will last. They do not like to grant such terms for two months. They want a longer period of peaceful operation. They make the following statement through Lewis Stockett, manager of the Canadian Pacific Railroad Co. Coal Department, their spokesman:

The average monthly wage since March, 1916, paid to all employees affected by the present demand is as follows:

For the quarter ending June 30, 1916, $76.52 per month; for the quarter ending Sept. 30, 1916, $88.28 per month; for the two months ending Nov. 30, 1916 (including war bonus), $83.36 per month (excluding from the calculation four days' strike in November, which if it had not occurred would have made the average wage for October and November $101.20 per month). In short, while the cost of living had increased, on the basis of a family of three, approximately $4 per month, and on the basis of a family of five approximately $7 per month, the wages earned had increased to Sept. 30, 1916, by $11.75 per month, and during October and November by $16.84 per month, notwithstanding a four days' strike, which if worked would have made the increase $24.68 per month.

Notes from an Engineer's Scrapbook

By A. T. Shurick

SYNOPSIS—Illustrations of some novel kinks for use in coal mining, supplemented by brief descriptions of their construction and application.

The accompanying illustrations show the details of a number of devises, selected from different sources, for use around mining plants. In every case these appliances are in actual usage, and in a great many instances they represent a gradual evolution from a number of years' practical application.

Fig. 1 represents a scheme for a kickback in cases where the refuse cars must pass over the dump and the same track as the coal. The device is simple and effective. It consists essentially of a small carriage operating on a pair of rails between the main tracks and held at one end by two heavy springs. An ordinary mine tie rests on the rails of the tipple track and backs up against two braces on the small carriage. Loaded cars dumped at the tipple run up the kickback until the wheels encounter the tie. The momentum of the car forces the tie back along the rails, carrying the small interior carriage with it and extending the springs; this serves to check the car gradually, eliminating any excessive jar or shock. When the car is finally brought to a stop the reaction in the springs, together with the moderate inclination of the kickback, gives it a rapid start on its return trip to the empty track. As will be noticed, the track slopes in both directions from the kickback. When a rock car is to be dumped the tie is simply removed; the car has such momentum in running over the tipple dump that it passes up this grade and on out to the rock dump.

New Theory in Rope Practice

Fig. 2 shows two of a system of knuckle rollers used instead of a sheave wheel in an abrupt change of pitch from approximately 5 to 30 deg. While the accepted theory in rope practice is that the maximum stress must not be on ropes except on sheave wheels 60 diameters of the rope, it was demonstrated in this instance, as well as in several others, that a long easy vertical curve supported by rollers set as close as practicable did not injure the rope. The theory of this system as worked out by F. W. C. Whyte, general manager of the coal properties of the Anaconda Copper Mining Co., was, that while some slight angles might develop in the rope when the loaded trip was standing still on the maximum pitch, this was eliminated when in motion by the rope assuming the character of a regular curve throughout. The conditions under which this special arrangement was used were such that it would seldom or never be necessary for the trip to stand under maximum load on the 30-deg. incline; but even when such would be the case, the wear in the rope when only standing still would obviously be practically negligible.

Fig. 3 illustrates a typical scaffold for dumping mine cars, with the added feature that it is readily movable. It will be noticed that the entire structure is built up on heavy planks so that it may easily be jacked along over the ties. Where dumping room is so limited that it is necessary to advance the point of dumping quite frequently, this device will be found very effective (see also *Coal Age*, Vol. 10, p. 190).

Fig. 4 shows a sketch and the leading dimensions of a heavy duty coupling that was evolved after many years of cutting and trying. This coupling is used on inclinations up to 22 or 23 deg. on which an average of 10 two-ton cars are handled. While the material may appear excessively heavy, it was gradually worked out after considerable experience as a coupling that would reduce the number of runaways to a minimum consistent with the results in view. And even then it is well to give these couplings the treatment in a large bonfire, say once each twelve months, in order to eliminate crystallization, to which they are peculiarly subjected because of the unusually severe shocks incident to the work for which they are intended.

Fig. 5 illustrates a novel application for old wire rope, which is usually so plentiful in slope- and shaft-mining regions. It is here used for the construction of a suspension foot bridge under conditions where an ordinary bridge would be rather expensive. The details of construction are clearly shown in the sketch in the lower right-hand corner.

Fig. 6 shows another type of car coupling, designed for use in drift mines with a tailrope haulage system and cars of two-ton capacity. The construction is much lighter throughout than in the case of the coupling shown in Fig. 4, while the two smaller links have been omitted and a concave indenture given to the connecting link to hold it in place. Aside from these features much that has been said about the coupling in Fig. 4, will apply equally well here.

Fig. 7 illustrates a type of rubble masonry mine mouth of a permanent character. It may be laid in either lime or cement mortar and the two sides stayed by two T-rails on each side anchored in the bottom and connected across the top by 1⅛-in. rods.

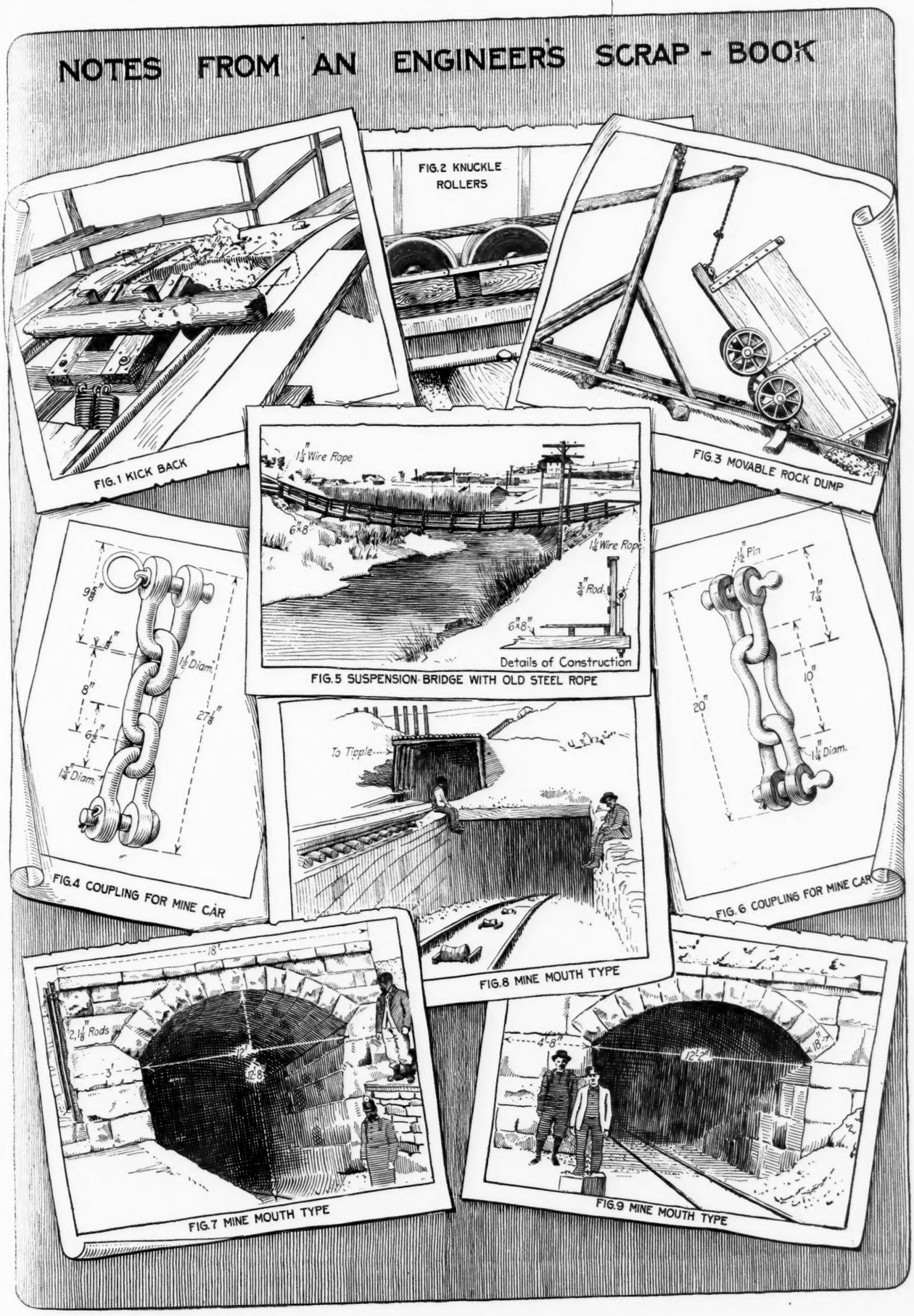
Fig. 8 shows a less expensive type of mine mouth for a slope mine. This consists essentially of stone retaining walls with timber supports. What is apparently an opening above and to the left is the track leading to the tipple, which has been covered over part of its length to keep it clear of snow in winter.

Fig. 9 illustrates another type of mine mouth similar to that in Fig. 7, though with a flatter arch. The side walls in this case are also somewhat heavier, as will be noticed, and the depth of the arch stone is 18 in.

All the devices described in this article are in use in the coal department of the Anaconda Copper Mining Co. at its various coal operations in Wyoming and Montana.

[This department, utilizing pen-and-ink sketches and the new Ormay process of illustration, offers unusual facilities for presenting new devices and methods for use in connection with mining operations. These illustrations are readily drawn from rough pencil sketches, working drawings, blueprints and photographs, and we wish to invite all our readers to contribute ideas they have developed in the course of their experience. It is possible by this process to make the idea in mind so self-evident that it is usually unnecessary to include any descriptive matter with it.—Editor.]

NOTES FROM AN ENGINEER'S SCRAP-BOOK



Editorials

Handicaps to the Miner's Health

Mine workers for the most part live in towns that are too small to support a dentist or an oculist, and so only the more acute needs of their teeth and eyes are ever attended to. The company doctor does not usually regard dentistry or the fitting of proper glasses as a legitimate part of his work. In this he can hardly be blamed. On occasion he will use the forceps, usually without much discretion. Sometimes he will fit glasses, but not with the precision of a specialist.

Thus it is that the mine worker's needs are often neglected and those of his wife and children also. When we realize how much our general health depends on the condition of our teeth and the ease of our eyes, it is easy to see what a boon good dentistry and competent optometry would be to the miner and his family.

Nowadays it is customary to forestall trouble by a periodical examination of the teeth and eyes. The Colorado Fuel and Iron Co. has just arranged this service for the younger children of its employees, as stated in the "Department of Human Interest" this week. The work will be extended later to the older children and it is to be hoped that eventually the mine workers and their wives, who need the attention as much as anyone, will also receive the benefit of such ministrations.

Subsidence Resulting from Mining

The bulletin on "Subsidence Resulting from Mining" has long been awaited. Now that it appears, it proves to be like all the publications of the University of Illinois, exhaustive, authoritative and carefully prepared. Yet in places it can hardly escape criticism.

The bulletin laboriously propounds in 27 pages the theories of subsidence held in Belgium, France, Germany, Austria and Great Britain. Some of these are extremely amusing, to say the least. Most of them the writers of the bulletin would never themselves have consented to propound. Many of them would have been passed over with indifference had not the material gained been hallowed, so to speak, by translation.

One wonders how such ideas can have been held by observant men to cover all the conditions of rock stress. But view as one may the value of what has been written by the investigators in those countries, the reader cannot avoid the conclusion that they, except three recent British engineers, regarded the whole subject merely as a problem in shear. That has not been the American stand.

Yet after the bulletin has reviewed European opinion it modestly states of the United States and Canada that "no new theories have been advanced by American engineers." Nothing can be more clearly disproved than is this statement in the all too brief eight pages which follow. The subject has been treated in the United States as one principally of bending moment and arch thrust rather than of shear, and there has been an elaboration of theory far greater here than in Europe.

The first American authority quoted on the theory of subsidence is Douglas Bunting. Mr. Bunting, by the way, is the last investigator to discuss the subject, though what he put into his paper, read before the American Institute of Mining Engineers, apparently originated with him and was not based in any way on studies which had preceded it. In the Young and Stoek monograph an inadequate review is given of his article; it overlooks the most interesting feature—the fact that the strength of the roof is based on a consideration of bending-moment stresses.

Mr. Bunting, it is true, considers each unsupported element of roof as a separate beam. He does not work out the problem as for a continuous structure extending over the pillars from room to room. Nevertheless, the fact that he believes that the strength lies in horizontal coherence and not in resistance to shear is the dominating feature in his presentation and completely differentiates his theories from those advanced abroad.

This reference in the bulletin, for it is little more, is followed by some remarks by George S. Rice and Charles Connor, which are not theories but rather matters of observation. There follow the truly theoretic statements of W. A. Silliman and S. A. Taylor, both taken from the proceedings of the Coal Mining Institute of America and both comments on the paper by R. D. Hall discussed in the bulletin immediately thereafter. One wonders why the authors, in making an historical review, chose in referring to American theories to put the latest first and put the discussions of papers before the account of their contents.

In the discussion of the paper in question W. A. Silliman disagreed radically with Mr. Hall's conclusions, while S. A. Taylor agreed with them and made the statements set forth in the bulletin under his name. The first of Mr. Taylor's remarks were merely a reënunciation and approval of the principles set forth in Mr. Hall's paper. The last have reference to a different matter, but he takes occasion even there to say that he does not agree with certain British authorities.

Reference to Mr. Hall's many papers then appears in the bulletin. The résumé is accurate, but how any one can think when he reads the theories that they follow lines already outlined in the monograph one cannot imagine. They do not resemble in any way the ideas set forth by the Belgians, French, Germans and Austrians in the 27 pages preceding, nor is there much likeness between B. S. Randolph's theories which follow and those promulgated in Europe. Claude T. Rice's suggestion, which is earlier than Mr. Randolph's and along the same lines, is quite brilliant and not at all foreshadowed in the European discussion.

There seems a disposition to believe too often that an apology is needed for our American engineers. There are some who seem to believe that a foreign theory has a far greater probability of correctness than one framed and fashioned at home. However, it seems fair to hope and

believe that the problems of roof stress will be found to have been understood better here than abroad, though the art of roof control has been better worked out in Germany and England; in the former by perfecting the American system of hydraulic filling and in the latter by the invention of longwall.

Between our collegians who ascribe too much to foreign investigators and our uninstructed who think every good idea takes root only on American soil, we find it hard to arrive at a median line of proper self-appreciation. On the whole we would as willingly believe Bunting, G. S. Rice, Connor, Silliman, Taylor, Hall, Randolph, McNair and C. T. Rice as Gonot, Toillez, Rucloux, Fayol, Schulz, Hausse, Rziha, Jicinsky, Dickinson or Knox. The fact that we know the former and do not know the latter does not in any manner give us any reduced confidence in them.

To these American names must be added that of L. E. Young and H. H. Stoek, the authors of the bulletin. In their opening pages they talk about bending moment, and all through the booklet evidence their belief in the effect of that stress. In this they show themselves in accord with what is an almost, or wholly, exclusively American point of view.

Let it not be thought that there is any disposition to overduly laud the trend of American thought. The theories American engineers have propounded are so palpably obvious that the wonder is that European engineers had not lighted on them long ago, and American engineers also for that matter. It shows that the men in Europe who have considered roof action have not been of the quality of the men who have raised on that continent an enduring monument to themselves by their enlightened discussion of mine explosions.

Universal Need for Training

One sometimes wonders how the world in earlier centuries got along with only one or two per cent. of the people able to read and write, and the rest without any education. It is hard to understand how it managed to do its business with every kind of misconception of the laws of nature and with a blind belief in chance, the evil eye, the unlucky thirteen, and other like superstitions. One cannot see how industries prospered when the people were never trained to think of causes and effects.

We would hardly wish to return to those old times. We could hardly operate our mines in them. Those were the days when miners opposed the putting of wheels on the boxes in which they hauled their coal and protested against every kind of machine because the mine worker had not been trained to delight in ways of circumventing the harsh necessities of nature.

But even now we seem satisfied to have our education in mining as narrowly restricted as general education was in the earlier days. We may educate everyone in reading, writing, arithmetic, history and civics today, but we still only teach one or two per cent. the mysteries of mining. It is a new idea to spread somewhat complete and accurate knowledge of the mining art to 100 per cent. of the men and have them all interested in the way in which the work can be most efficiently performed.

And indeed our mines show that the thinking, planning, contriving is nearly all with the one or two per cent. The rest are not doing any of the mental labor. They would not be much encouraged by the management if they were. There is, as Josiah Keeley said at the West Virginia Coal Mining Institute, no "pride of work." Work has not been explained to miners as something to be proud of.

The engineer is proud of his clean engine, the driver of his well-kept team, but the miner is not proud of his straight track, his rib true to line, the methodical placing of his props, the regularity and cleanliness of the passing space between the rib and the road, the neatness and closeness of the gobbing and the provisions for complete and safe recovery of coal. In fact he is not as conscientious a workman in any way as were the coal "hewers" of the past.

There are many things which he needs to be taught and many ideas which need to be inculcated. He has learned there is a correct way to spell and to pronounce, there are certain curves to use in writing, there are rules in grammar, but his life work, mining, has never been taught him as a thing worthy of study. He gets it haphazard and learns as often how not to do it as how it really should be performed.

Some training is certainly necessary but not even the books are as yet provided. With three-quarters of a million putative scholars we have nothing wherewith to teach them. The farmers have their books of instruction. We, as yet, have not. It seems that it may be years before they are issued. Yet they are badly needed.

The interesting article of I. Rowland Brown, on "Line and Return Troubles in the Electric Haulage of Coal Mines," published in last week's issue, clearly reveals what possibilities there are for the real expert road lineman. It shows how essential it is that the trolley cars shall be placed so as to keep kinks out of the line. It shows how a clever road lineman can test the resistance of his track bonds. But there are many other matters. In fact, quite a neat book could be written on such electrical work and others are needed on timbering, on mine blacksmithing, on the care of mules, on mining and on many other subjects.

Some effort should be made with the headingman, the tracklayer, the machineman, the car loader, the timberman and the dumper. These men need to understand their whole work, both as to safety and as to efficiency. They have indeed much to learn. But how can we teach them, seeing that we do not know the many languages of our polyglot help?

Coal Age's answer to that question is very simple if not ingenuous, and it is this: Times without number you have demanded that the mineboss and the fireboss teach the miner. If it is easy for them, surely it must be easier yet for the more intelligent manager. You have demanded that the foreman answer the problem, yet you yourself have declared that it is too large a difficulty for you to attempt to solve it.

Why waste so much time on producing one or two or perhaps a half-dozen more or less perfect men, when better results could be secured by producing an altogether reasonable development in the efficiency of the body of the workmen? These men ought to be as competent as the foremen and firebosses, for in many cases they are getting equal or better pay for less hours of work. We may talk loudly of industrial schools but until they reach everyone employed, at some period of his life they miss the main purpose of their establishment.

Department of Human Interest

Taking Good Care of the Children of Mine Employees

The Colorado Fuel and Iron Co. has undertaken to care for the eyes and teeth of the school children in its mine villages, beginning with the lower grades, according to an announcement made at the general offices of the company. An oculist and a dentist have been employed by the medical department under the direction of Dr. R. W. Corwin, chief surgeon, and soon will begin a series of visits to the various mining regions. The company is coöperating with the board of education of the city of Pueblo to secure similar service for the children of its steel-mill workers.

An article which appeared in the *C. F. & I. Industrial Bulletin* under date of Jan. 31 explains that this course has been decided upon by the company because of the manifest importance of the care of teeth and eyes in childhood in preserving the health and promoting the highest degree of mental and physical vigor in later life.

In undertaking this work, the *Bulletin* article continues, the company will coöperate with its employees and with the public-school authorities in the communities affected. The plan of action which has been decided upon was submitted to Mary C. C. Bradford, Colorado State Superintendent of Public Instruction, and received her approval.

Oculist and Dentist Employed

The oculist engaged for work in the company's mine villages is Dr. Eldridge Adams. Mr. Adams, after his graduation from Rush Medical College, Chicago, was engaged for some time in industrial, medical and surgical practice in the copper country of Michigan. Later he returned to Chicago to take post-graduate and other specialized work in surgery of the eye, ear, nose and throat.

Dr. W. A. Brierley has been employed as chief dental surgeon. He is a graduate of the Colorado College of Dental Surgery, and has been in active practice in Denver for 19 years. He is a former president of the Colorado State Dental Association.

The Colorado laws require the school authorities to make examinations of pupils and report to the parents any serious defects, especially of the eyes or teeth. The Colorado Fuel and Iron Co. recently decided, in order to make this work as effective as possible in its mining communities, to go even beyond the legal requirements by coöperating with the school authorities through its medical department, and making provision not only for making the required inspections, but also for having the necessary work done.

Arrangements are being made with the boards of education to have the inspection work done during school hours, as a part of the regular educational course. The dentist and oculist, traveling separately, will visit all the camps in turn, and it is expected that they will reach each mine about twice a year. Before the first visits notices to parents will be distributed in the camps, explaining the work of the specialists and requesting the coöperation of the parents in making the plans successful.

On the first inspection trips to be made early this year the work will be confined to the children of the first grade. The dentist will clean and examine the teeth, furnish tooth brushes without charge and fill teeth when necessary. The oculist will test the eyes of the children and prescribe glasses when they are needed.

There will be no charge in addition to the regular medical fee for any of this work, except for glasses, and these will be furnished at actual cost. When it is found necessary to fill a child's teeth or to use drops in order to make a more thorough examination of his eyes, the written consent of the parents will be secured. One or more dental nurses or assistants will be employed to aid the chief dental surgeon in his work.

It is expected that this addition to the medical work later will gradually be extended to include additional groups of older children.

The board of education of Pueblo, with the coöperation of the Colorado Fuel and Iron Co., recently arranged to furnish dental work in the first and second grades of the schools of that city. Under this arrangement the children of employees of the company are insured the same benefits at both the steel plant and the mining villages.

This is the first company to undertake this modern specialization of dental work among the children of employees. The plans have been wrought out in conference with the leading members of the dental profession, and are adapted from the thorough work being done in the public schools of Bridgeport, Conn., under the direction of Dr. A. C. Fones.

Bank Deposits as a Barometer of Prosperity in Anthracite Region

Statistics compiled by the Anthracite Bureau of Information at Wilkes-Barre, from reports received through the courtesy of 56 banks distributed among the nine principal cities of the anthracite region, show an increase in deposits in one year—from November, 1915, to November, 1916—of 14 per cent., the number of banks that reported in each city and the total deposits and increases being shown in the following table:

City	Banks	Deposits, 1916	Deposits, 1915	Increase — Amount	Increase — Per Cent.
Wilkes-Barre	12	$31,458,591	$28,476,075	$2,982,516	10
Scranton	18	50,606,461	43,953,114	6,653,347	15
Mahanoy City	2	2,547,535	2,069,849	477,686	23
Shenandoah	4	3,606,322	2,942,232	664,090	22
Pottsville	5	8,477,770	7,422,010	1,055,760	14
Hazleton	4	11,141,093	9,777,327	1,363,766	14
Mt. Carmel	3	2,978,697	2,375,039	603,658	25
Shamokin	4	4,893,477	4,133,032	760,445	18
Pittston	4	8,312,357	7,557,134	755,223	10
	56	$124,022,303	$108,705,812	$15,316,491	14

Distributed by the recognized anthracite trade regions, 34 of the 56 banks reporting were in the Wyoming region, 18 in the Schuylkill, and 4 in the Lehigh, the largest percentage of increase being shown in the Schuylkill re-

gion, which made a gain of 18.8 per cent. The Lehigh region showed a gain of 14 per cent. and the Wyoming region 13 per cent., as shown in the following regional summary:

Regional	Banks	Deposits, 1916	Deposits, 1915	Increase — Amount	Increase — Per Cent.
Wyoming	34	$90,377,409	$79,986,323	$10,391,086	13
Lehigh	4	11,141,093	9,777,327	1,363,766	14
Schuylkill	18	22,503,801	18,942,162	3,561,639	18.8
	56	$124,022,303	$108,705,812	$15,316,491	14

In considering these statistics it should be remembered that although by far the greater part of the bank deposits in the anthracite region flows originally from the payrolls of the anthracite mining companies which distribute annually some $150,000,000 in wages, the bank deposits are not unduly swelled by the accounts of the larger mining companies whose chief balances are kept in New York and Philadelphia. The regional bank deposits are for the most part maintained by the local industries, tradesmen and the wage earners, no insignificant proportion being represented by the savings deposits of mine workers. Only two establishments in the anthracite region manufacture munitions of war, so the war has had little to do with this prosperity.

Vacuum Bottles for Noonday Lunches

Coal-mining companies, like other corporations, find that the food eaten by their employees has much to do with their efficiency. A cold lunch has a dispiriting effect mentally and physically, and the man who eats such a meal usually works less effectively after it than before.

Whether a coal company would feel justified in attempting to manage the lunching arrangements of its men is a matter for decision by its officers, but it might go the length of putting within their reach such equipment as would insure hot lunches and better health. The vacuum-bottle manufacturers have a number of lunching outfits that are sold at a rate which would make them attractive to workingmen. For instance, the "Icy-Hot" Bottle Co., of Cincinnati, has introduced a new kit that contains a pint vacuum bottle and space for a large lunch box.

VACUUM BOTTLE FOR MINE LUNCHES

This kit has a metal case, the top of which locks down to the main part by two snaps. Cases with one snaplock are apt to be wrenched or twisted out of shape, but the double lock prevents this. The vacuum bottle keeps coffee, tea or soup hot for 24 hr. The whole kit filled weighs less than 5 lb. and is therefore easily carried.

Extension-School Work in Wilkes-Barre

The recently formed Extension School of the Pennsylvania State College at Wilkes-Barre is proving popular among the young men employed in and about the mines and in the various other industries located in or near the city. The first classes were organized in October, and more recently it was decided to add to the course instruction in trigonometry and elementary mechanics. There has been a total enrollment of 157 students. The number of members in each of the various classes is as follows: Arithmetic, 18; geometry, 84; trigonometry, 39; elementary mechanics, 16; surveying, 26; mechanics, 44; electricity, 39; cement and concrete, 29.

Henry Dowst, Jr., a graduate of the Massachusetts Institute of Technology and a member of the Pennsylvania State College Faculty, is the supervisor of the Wilkes-Barre school. He has had considerable practical experience in reinforced-concrete work and surveying and is thoroughly equipped for the position. He has classes in geometry, trigonometry, elementary mechanics, mechanics and surveying. Instructors in other branches, who have undertaken to assist in making the school a success, are graduates of state and other colleges. A number of State College alumni are interested in the undertaking and are coöperating with the teaching force.

The young men enrolled will have the use of a first-class set of instruments which will aid them in securing a thorough course in surveying. Facilities for drafting will later be secured for the courses in design work. The favorable response from such a large number of ambitious young men and the interest displayed by them indicate a successful career for the new school.

A Prize-Winning First-Aid Team

The team of the B. F. Berry Coal Co., Standard, Ill., carried off the cup at the first-aid meet held at La Salle two years ago, and it has successfully defended it ever since. The team has been victorious not only at La Salle,

TEAM THAT HOLDS ONTO THE CHAMPIONSHIP CUP

Top Row, Left to Right—Andrew Parsons, George Ketwig, captain; Charles Simcox and Albert Parsons. Lower Row, Left to Right—Edward Edwards, and Walter Bean, patient

but also at other big meets in the state. On Dec. 23 of last year it again captured the first-prize money at La Salle and so was enabled to retain the cup for another year. The superintendent, J. T. Cherry, is exceedingly proud of the record of his team and is an enthusiastic supporter of first-aid work.

Discussion by Readers

Conducting Electric Power in Mines

Letter No. 1—My attention was attracted to the suggestion of Robert Brown, *Coal Age,* Dec. 2, p. 911, in regard to providing an extra conductor to transmit the power required to operate mining drills, cutting machines, pumps, etc., instead of tapping the trolley wire, according to the common practice in mines.

While I have often advocated the method of wiring new mines with separate conductors for all cutting machines, pumps, etc., and preserving the trolley wire for haulage purposes only, I cannot agree that such method is of advantage in all cases. To provide and install separate conductors in large mines having extensive workings would be out of the question, owing to the enormous outlay for wire.

The delay caused by an irregular or inadequate supply of power at the working face becomes almost inconsiderable in large operations having well-designed power plants and a properly installed system of wiring and rail bonding. In regard to pumps, where these machines are equipped with automatic starters the trouble arising from this cause is reduced to a minimum.

As another reason for using separate conductors for machines other than locomotives, Mr. Brown refers to the section in the bituminous mine law of Pennsylvania (1911), which reads:

> All branch trolley lines shall be fitted with an automatic trolley switch or section insulator and line switch, or some other device that will allow the current to be shut off from such branch headings (art. 11, sec. 41).

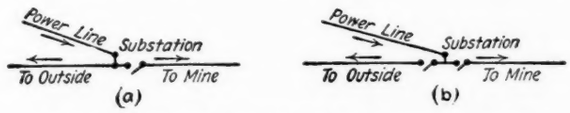
The mining law requires that section insulators be put in where a branch trolley leaves the main line, but does not state the purpose of the insulator or how it shall be used. Its purpose is evidently to permit the power to be cut off from the branch line when the locomotive leaves that section, in order to reduce the liability of accidents from shock to men and animals. Strange to say, however, in the majority of cases these insulators have not been used with this object in view.

Assuming that the purpose of the section insulator is to cut off the power from a section on the departure of the locomotive, I would advocate an automatic section insulator that would be operated by the locomotive as it passes out of the section onto the main line. Where a hand-operated insulator is used, it would frequently occur that the motorman would forget to throw the switch and the power would remain on the branch line when it was supposed to be cut off. This would prove a greater menace than if no insulator was installed.

An objection to the use of an automatic section insulator, in compliance with the requirement of the bituminous law, is that it would then be necessary to install a separate feed line for the continuous operation of cutting machines, pumps, etc., in each section. Such a feed line would have to be insulated its entire length in order to provide the degree of safety contemplated by this section of the law.

The purpose of electrical equipment is to provide a continuous power supply to all parts of the mine where it is required, and the expense of doing this must not be prohibitive. Mining conditions are such, at the best, that it is impossible to wholly avoid a chance accident. Even when conductors are insulated and installed in the aircourses, it is possible for a fall of rock to damage the insulation; or, if the cable is protected by armor, a heavy fall of slate may cause the armor to penetrate the insulation and become charged with the full current, which might prove disastrous. Such conductors are more expensive to buy and install than trolley wire, which is not affected by mining conditions. For these reasons, it is necessary to adapt the installation to the particular conditions prevailing in the mine.

Almost the universal custom is to use a single switch or insulator in the power line leading from the generator



SECTION INSULATORS AT MINE ENTRANCE

into the mine, as shown at (a) in the accompanying figure. It is my practice to use two such switches or section insulators, as shown at (b), so as to enable the power to be shut off from the mine or from the outside equipment independently. Then, should it be necessary, for any reason, to cut off the power on the outside of the mine, this would not interfere with operations underground.

T. O. HUGHES,
Windber, Penn. Mining Electrician.

Textbooks in Examination

Letter No. 11—Judging from the numerous letters that have appeared in *Coal Age* on this subject, there seems to be quite a difference of opinion in regard to the question of candidates in examination having access to textbooks.

To my mind, it will make little difference in the long run whether examining boards in future examinations decide to give candidates this privilege or not. Coal miners who deserve to pass a satisfactory examination will appear before the board fairly well schooled in such questions as they will be asked.

It is only those men who have studied and prepared themselves for the examination that deserve to pass. With a lead pencil and a pocket knife to sharpen it, they will enter the examination confident that they will be able to prove on paper that they are qualified, from a practical standpoint, to take charge of a mine.

It is the duty of examining boards to select such questions as they believe will determine a candidate's practical ability to fill the position for which he is striving to qualify himself. In addition to the questions relating to practical mining work the board should select

simple technical questions similar to those that were recently suggested in *Coal Age,* Jan. 6, p. 34. As there stated, these are the class of "technical questions that mine foremen should be able to answer."

I quite agree with M. D. Cooper, who suggests at the close of his letter on page 32 of the same issue of *Coal Age* that examining boards should issue, from time to time, "a guide for prospective candidates, stating clearly the essential formulas that should be learned and outlining in a general way the range of questions that would be asked in the coming examination."

It is interesting to note that some large coal-mine operators have opened night schools and furnished teachers to give the needed instruction. They have also sent to their employees selected mining questions for study. I think this is a splendid move, as a large number of miners will learn many things that will enable them to take better care of themselves in the mine.

It is not desired to make these men mining experts, but rather that everybody should be taught that he is a guardian of his fellow worker and that upon his acts may depend the safety of all underground. The study of mining questions should be directed with this thought in mind and, whatever is decided in regard to the manner of conducting an examination, there should be no opportunity given candidates that would enable them to copy their answers from books.

Walsenburg, Colo. ROBERT A. MARSHALL.

Coal-Mining Examinations

Letter No. 15—I fully agree with John Rose, who remarks, *Coal Age,* Jan. 13, p. 109, "Only such questions should be asked candidates in a mine foreman's examination as pertain to the practical operation of a mine from the standpoint of safety and economy." In my opinion, the practical side of mining is almost forgotten in examination.

Further, I want to ask, What is the use of making the examination so difficult for practical men, when the Pennsylvania mining law permits coal companies to employ men as foremen who have no papers. Under these conditions, why not make the examination such that more of these practical men can pass and get a certificate?

While it is true that a number of practical men have been able to pass the examination for mine foreman, assistant foreman and fireboss and have received their certificates, it cannot be denied that many of the men who pass successfully and receive a good percentage mark have little practical experience that would fit them for taking charge of a mine.

Personally, I believe that every mine foreman should have some technical knowledge to go with his practical experience. But we must not forget that there are many good miners today that never had the chance to get such knowledge in their early life and still have proved that they are capable of taking charge of a mine and looking after it better than many fellows who pass a good examination, and the standard seems to be getting higher each year and more difficult for these men of limited education to pass.

Education is a grand good thing and I wish that I had more of it myself; but, in my opinion, it cannot take the place of the actual experience gained by the man who has stood the hard knocks in his many years of mining practice. It is not for myself, however, that I am now speaking, but for others who have an ambition to pass the examination and get a certificate. After more than 30 years of mining experience, above 10 years of age, I am sorry to say that I have not the same ambition today to secure a certificate of competency.

In closing let me say that one of the chief things a mine foreman must learn is how to treat his men and be fair and just with them. He must learn to trust his firebosses and assistants and not listen to idlers that wander about the mine and report that a fireboss or assistant foreman "is not doing his duty," or that a certain place "is unsafe." There are many such men in mines, and the practical foreman is quick to discover them. DIX.

——, Penn.

Discrimination in State Mining Law

Letter No. 1—I cannot agree with Robert A. Marshall, *Coal Age,* Jan. 13, p. 109, in his claim that the law is just that requires candidates to work two years in Colorado mines before permitting them to take the examination and receive a certificate. I believe that any law that bars a man from this privilege is selfish in spirit and in principle. It not only restricts the advancement of ambitious miners but is an injury to the state and industry and unjust to men coming from other states.

The examining board must decide on the qualifications of individual candidates, and it is only just that these qualifications should have regard to the fitness of the men to hold such positions as they may desire to fill. The state law should not limit the choice of the examining board to men who have resided a given time within the state, as there are equally competent men in other states who, but for this restriction, would gladly make Colorado their home. If a candidate for a certificate is able to satisfy the board in regard to his ability to fill a position, that is all that is necessary and they should be free to grant him a certificate, testifying to his competency, regardless of the fact that he comes from outside the state to make Colorado his future home.

A BAD FEATURE IN THE COLORADO LAW

A man may have worked in border mines, in a neighboring state, where the conditions underground are precisely similar to those existing in Colorado mines. He may be a competent man and have given complete satisfaction in the position he previously occupied, yet, owing to the Colorado law, this man is debarred from filling a like position in a mine across the border, possibly owned and operated by the same company.

Under the present law, this man must take up a residence in Colorado and work in the mines of that state for two years, in an inferior position, and then pass an examination before being permitted to act in an official position in those mines. It is claimed that the purpose of this law is to protect practical mining men who have resided the required time within the state. I want to ask, again, if the effect of this law is not both an injustice to competent men and a hindrance to the best interests of Colorado.

As superintendents, mine foremen and firebosses of the United States, let us rather extend the hand of welcome to all competent men filling these positions or capable of filling them, from whatever state they hail, and be willing

to take our chances with them in securing official positions in the mines.

Let us not try to build a fence around ourselves to keep others from enjoying our privileges; but rather let us encourage experienced and practical mine workers to coöperate with us and give us the benefit of their experience in the hope of broadening our own knowledge and field of operation. R. J. PICKETT.

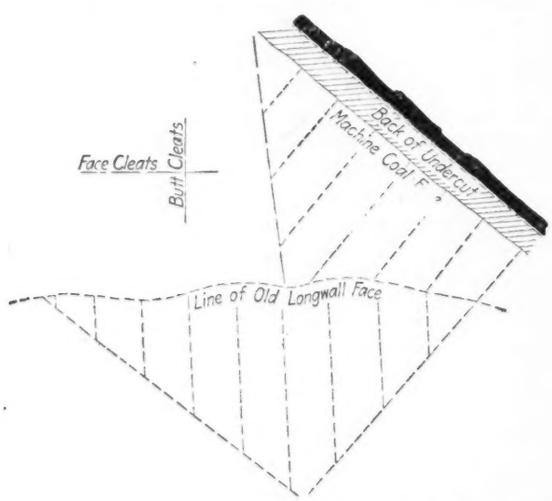
Shelburn, Ind.

Roof Troubles Overcome

Letter No. 1—Referring to the request for information in regard to working coal under a roof that slacks, *Coal Age*, Jan. 6, p. 33, permit me to explain how we were able to overcome similar troubles on two occasions. One of these operations was a longwall mine, while the other was worked by driving entries and rooms.

In each case the coal was a trifle thinner than that mentioned in this inquiry. The seam was about 4 ft. thick and immediately overlaid with 3 ft. of fine shale that formed a very frail roof that fell in thin flakes or slabs after a short exposure to the air of about 24 hr. If a place was idle a single day, it would be blocked with this light material fallen from the roof and would have to be cleaned before proceeding with other work. The soft roof shale was overlaid by a harder sandy shale.

The first mine was opened on the longwall system of mining, which was all done by hand and much heavy



STARTING A MACHINE FACE IN A LONGWALL MINE

timber used to support the roof at the face. As indicated in the figure, there were well developed face and butt cleats, the former being parallel to the longwall face. In this system it was a common thing to find a section of the face blocked in the morning and frequently a box left standing at the roadhead would be found completely buried the following day, the roof shale falling from the end of the brushing right up to the coal face. This would frequently necessitate driving around the obstruction.

The coal was a valuable coking coal and it did not matter how much "fine" was produced in mining. In order to overcome the troubles I have mentioned it was decided to try the experiment of cutting a longwall face with machines. It was thought best to have this face advance across the cleats at an angle of about 45 deg., hoping thereby to gain greater support for the roof. This hope was more than realized and the change was found a great improvement over the old method on two accounts: First, the roof was stronger, requiring less timber; and, second, the face advanced about twice as rapidly and was exposed a shorter time to the action of the air.

When mining by hand, the attempt had been made to advance the face on the butts of the coal, but this gave little satisfaction. The mining was more difficult, as we were then working on what might be called the "teeth of the coal."

While in hand mining the face was advanced only from 18 in. to 2 ft. a day, by the use of machines this was increased to 3 ft. 6 in. a day, or nearly double the previous amount. As may be supposed, there were occasional bad areas where the roof gave some trouble, and it has happened that a machine has been buried by a fall. When driving across the cleats, the coal does not break as readily, of course, as when advancing "face on," but the advantage is gained of greater roof support, which is the main object to be desired. The difficulty, however, was partly overcome by working off the coal in slabs, the line of break coinciding with the face cleats of the coal, as indicated by the hatchlines in the figure.

HANDLING A FRAIL ROOF WHEN DRIVING ROOMS

In the other mine mentioned rooms were driven off the side levels. The road was carried up what would be the center of the finished room. The coal was taken out for a width of about 4 yd. on one side of this road, while driving it to the limit, about 50 or 60 yd. Then the coal on the other side of the road was taken out about the same width, on the retreating plan, beginning at the face of the room and working back toward the entry.

The conditions in this mine were practically the same as those previously described. The chief difficulty was found in supporting the roof on the levels. The soft shale overlying the coal had to be taken down, as it gave too much trouble by blocking the roads. It was found necessary to use mudsills under each alternate timber frame in order to avoid the legs of the timber sets being forced into the soft clay bottom. The material underlying the coal resembled the soft shale in the roof and, while comparatively hard at the face, this material became a soft yielding clay on the roads.

In the rooms we took advantage of a thin stratum just above the coal that was slightly harder than the soft roof shale. Leaving this up assisted somewhat in supporting the softer material above but, like the rest, it soon slacked on exposure to the air, though not as quickly as the softer shale.

Owing to the frail roof, it was often found necessary to double-shift some of the rooms, in an effort to work them out as rapidly as possible, especially if the roof showed signs of giving trouble. When driving a room up, posts with tapered tops were set in line on the side of the road from which the coal was taken out. These posts were alternated with the ordinary posts and cap boom.

Experience inclines me to say that the success in working such coal seams, when they can be worked at all, lies in adopting some means of quick extraction so that a fresh piece of roof is exposed each night at the face. When first exposed, the roof is comparatively strong, but becomes rapidly weak on exposure to the air. Double-shifting the work is a good feature where this is possible.

The nature of the material is clearly shown on the dirt dump where the upper crust is comparatively hard, overlying a crumbling bed of fine shale, beneath which is a disintegrated mud or clay. MINING ENGINEER.

Sydney, N. S.

Cleaning Up a Roof Fall

Letter No. 1—Referring to the inquiry in regard to whether an assistant foreman performs his whole duty when he sends a man to clean up a fall of roof and does not instruct him in the manner in which the work is to be done, so as to insure his safety while performing the task, allow me to say that no foreman or assistant foreman should send an inexperienced man alone to perform such dangerous work.

He should always send an experienced timberman to take charge and see that the work is properly and safely performed. I am certain that no timberman would allow a man to start to clean up a fall of roof before he has first pulled down all loose slate and secured the edges of the fall with suitable timber.

It is certainly the duty of an assistant foreman when ordering such work done to send experienced men and to give them the necessary instructions and, furthermore, to see that his instructions are carried out.

Barnesboro, Penn. FRANK GOAZION.

Letter No. 2—When a fall of roof occurs in a mine, and someone is sent to clean it up, the official who orders the work done should certainly give the men he sends full instructions in regard to safety.

The fall should first be carefully examined, since it often happens that the roof is sagged for a considerable distance on either side of the caved portion. Before sending a man to such a place, a foreman should instruct him to keep himself safe by setting timbers around the edges of the fall and then proceeding to take down all loose pieces of slate.

The foreman should see that there is plenty of timber on hand at the place suitable to be used in securing the roof. He should not fail to tell the men to timber as they go, so that they will always be working under safe top.

In the case mentioned in the inquiry in *Coal Age,* Jan. 20, p. 165, I would say that the assistant foreman certainly made "a grave mistake," when he allowed the man to go to work without first making himself safe. Practice "safety first" and fewer accidents will happen is my motto. JACOB RILEY.

Universal, Ind.

Letter No. 3—Referring to the inquiry on this subject, *Coal Age*, Jan. 20, p. 165, it is my opinion that the assistant foreman made a mistake when he failed to instruct the timberman to carefully examine the roof and make himself safe before starting to clean up the fall. This should always be done no matter what it may cost. No dayman should be sent to clean up a fall before the place is made safe for such work.

The bituminous-mine law of Pennsylvania (art. 4, sec. 6) requires that the mine foreman "shall see that no person is directed or permitted to work in an unsafe place, unless it be for the purpose of making it safe." The accident referred to in this inquiry should prove a warning to mine officials in respect to the necessity of complying with all the requirements of the mine law.

Sec. 10 of the same article of the bituminous law reads: "Instructions shall be given the men by the mine foreman, assistant mine foreman or fireboss, or other authorized person, as to when, where and how timbers shall be placed so as to avoid accidents from falls . . . A mine official has no right to take a chance, as sooner or later this will prove a fatal mistake.

In the present instance I imagine that the assistant foreman knew the timberman to be a good practical man, as such men are generally selected for that work. In sending such a man to clean up a fall the foreman might take it for granted that he understood his duty and did not need to be told.

I consider that it is quite probable that the man given charge of the work was careless and that he recklessly neglected to take the necessary precautions to make himself safe. I do not think that all the blame, in such a case, should be placed on the assistant foreman because he failed to repeat the instructions that he assumed an experienced timberman knew already and would observe.

JOHN BUGGY,

Chambersville, Penn. Assistant Foreman.

Mine-Accident Records

Letter No. 7—From a reading of the letter of T. Golden, relative to the killing of two shotfirers at No. 3 Crown Hill mine, *Coal Age,* Jan. 6, p. 30, I am led to believe that the shotfirers, in that case, were partly to blame themselves for not knowing that the holes were probably overcharged. Also, much blame would rest on the entrymen who overcharged the holes in defiance of the mining law of the state.

But I want to draw attention to what is probably a typographical error in Mr. Golden's letter, which states that the Indiana mining law "limits the weight of powder that may be placed in the hole when blasting coal or other material in the mines to 8 lb. for each hole. Chap. 7, sec. 2, of the revised mining laws of Indiana limits the weight of charge to 6 lb. of powder; and sec. 3 prohibits the drilling of any hole past the end of the cutting—"loose end" or "chance."

Under the conditions described in Mr. Golden's letter, it is evident there was no discipline enforced in this mine. While, as I have stated, blame certainly attaches both to the miner who charged the hole and to the shotfirers whose duty it was to fire only such shots as they believed complied with the law, I want to say that the real blame for these conditions must be placed back on the shoulders of the management of the mine. The mine officials were, or should have been, aware of the unlawful practices of the men in their employ, since it is stated that the men had been warned several times against these practices.

The fact that it was found on further examination that the entryman in the next heading to the one in which the accident occurred had drilled a hole 4 ft. 6 in. on the solid and charged it with 6 qt. of powder is evidence that the law was being violated on every hand. The further fact that, as stated, no prosecution followed in either case shows that the management and the inspection department were culpable.

Allow me to suggest in closing that the Industrial Board of Indiana, coal operators and coal miners, should get together and take some action for the protection of

shotfirers. In my opinion all shotholes should be examined, charged and tamped by the shotfirer, who should be a practical miner and required to pass a rigid examination before being allowed to take up his duties. No shots should be fired by any other person. Only by thus preserving proper discipline in the mine can such accidents as these be avoided.

Universal, Ind. WILLIAM JARDINE.

Checking In-and-Out System in Mines

Letter No. 1—In reply to the inquiry regarding the best method for checking men going in and coming out of the mine, *Coal Age*, Jan. 20, p. 165, allow me to describe briefly the system employed in our mine where, I may say in passing, the daily output is 3000 tons of coal. The system is as follows:

Every man working in the mine, in any capacity whatever, has a check number and the lamp he carries is marked with the same number. He is also given a brass check numbered to correspond.

When going into the mine in the morning, the miner calls for his lamp and gives the fireboss or lampman his brass check, receiving in turn his lamp, which has been cleaned, filled, examined and lighted before it is given out. The check is hung on a board, provided with hooks that are numbered to correspond to the check numbers of the men.

After hanging the check on its proper hook, the lampman checks off the man's number on a record sheet. This sheet contains all the numbers corresponding to the hooks on the board and is kept on file as a means of checking up the accounts of the men, since it shows exactly what men worked in the mine each day. It has proved of great advantage more than once in settling disputes in regard to the time worked by different men, who have frequently claimed time when the sheet showed that they were not in the mine on such days.

As a double check on the correctness of the sheet, it is the custom when the men come out of the mine at night and return their lamps and receive in turn their brass checks taken from the board, for the lampman to draw a circle around the checkmark that was placed on the sheet in the morning. The checkmark shows that the man went to work in the morning and the circle around it shows that he has come out of the mine and returned his lamp. I may add that the same numbers are entered in the office account against the name of each man working in the mine. This system has been used for a long time in our mine and has given good satisfaction.

———, Penn. SUPERINTENDENT.

Letter No. 2—Allow me to describe the methods in common use among some of the larger anthracite companies for checking the men in and out of their mines. The system is not the same at all the mines, but is at times quite primitive and open to criticism.

For example, one of the older systems in use is the common tally or "peg board." When going into the mine in the morning each man sticks a peg in the hole that is marked with his name or check number. These boards are often located at the bottom of the shaft or slope. At other times they are placed in the gangway leading to a particular section of the mine, in which case the fireboss in charge of that section has supervision of the board.

Such a system is evidently open to the objection that, in case of serious accident, in their haste to escape from the mine men would rush by the board without giving it any attention. Or, in case of fire, the board is liable to be destroyed and the record lost. All will agree that a checking in-and-out board should always be located on the surface at the mine entrance or in the lamproom or company office, where it would be out of danger and could be properly supervised and consulted to ascertain what men still remain in the mine, which is a matter of grave importance in case of a fire or explosion, necessitating rescue work.

At one colliery the checking system is in charge of the supply clerk. In his office there is a large board fitted with hooks numbered to correspond to the check numbers of the men. Before a man can be lowered into the mine, he must get his check from the supply clerk, who hangs a duplicate check on the hook corresponding to that number. When the man comes out of the mine he must return his check to the clerk, or he will receive no credit for having worked that day.

If a dayman leaves the mine at an unusual time, the fact is noted on a slip of paper, which is placed on the hook with the return check. The inside timekeeper checks his time with the bulletin board in the office of the supply clerk before turning in the time for the men. This method requires a night clerk to look after the board while working on other clerical duties.

SUGGESTS THE TIME CLOCK IN THE PAY OFFICE

Time recorders such as are in use in factories and machine shops have been tried at one colliery. The men went on a strike against the system introduced, but the umpire ruled them in error when the case came before him. At another time and place the men struck against the use of the brass check, because of the custom of charging a man 50c. for his check, although this deposit was always refunded when a man left the service of the company.

Many of the anthracite mines have openings that are widely separated, and it is possible for a man to sneak home without the knowledge of the timekeeper or foreman and turn in his check later at the regular time, as though he had worked the full day. Aside from the loss to the company on this account, the mine foreman is frequently put to the annoyance of having to look for a man who has not reported at the office.

Allow me to suggest that a time clock located at some central point outside, preferably in the office of the payroll clerk, would not only enable him to keep track of the men going in and coming out of the mine, and keep him informed when a man is changed and put to work in another part of the mine, but would also be of great assistance to him by enabling him to become acquainted with the men and thus avoid the confusion that occasionally arises from a man getting the wrong pay envelope.

It is true that the mine foreman is charged with the distribution of the pay statements and is on hand when the men draw their pay, but it is practically impossible for him to know all the men working as contract laborers, and a mistake is frequently made under the present system, which I believe would be avoided by a clock system under the supervision of the payroll clerk.

Minersville, Penn. J. KENVIN.

Inquiries of General Interest

Estimating Drawbar Pull

Kindly give me a formula or rule by which the drawbar pull of a 6-ton locomotive can be estimated, in mining practice. CHARLES RODENBUSH.

Christopher, Ill.

The possible drawbar pull of a mine locomotive will depend chiefly on the weight on the drivers, the kind of wheels used and the condition of the track. Assuming a level road and a good condition of the mine track, it is customary to estimate the drawbar pull that a locomotive is capable of exerting as being 20 per cent. of the weight of the locomotive resting on the drivers, when cast-iron tires are used. When wheels with steel tires are employed the drawbar pull, under the same conditions, may be assumed as high as 25 per cent. of the weight resting on the drivers. These estimates assume a clean rail. By the use of sand, the possible drawbar pull may be estimated as from 25 to 30 per cent. for wheels with cast-iron tires and from 30 to 33 per cent. when steel tires are used.

Mine locomotives are generally built so that all the wheels are drivers, and it is only necessary to estimate the drawbar pull as a percentage of the entire weight of the locomotive, in accordance with the data just given.

When the track is inclined it is necessary to multiply the drawbar pull, estimated for a level track, by the cosine of the angle of inclination of the road, since the normal pressure on the rails is the determining factor and this normal pressure is equal to the weight resting on the drivers, multiplied by the cosine of the angle of inclination of the track.

Posting of Certificates in Company Office

A short time ago one of the contributors to *Coal Age,* in discussing coal-mining examinations, stated that the superintendent of the mine where he had been employed as fireboss called him to the office and read a letter that had just been received from the chief mine inspector of the state, which announced that on and after a certain date "every official employed in the mine must have his certificate posted in the office of the company for inspection."

Sec. 43 of the Coal-Mining Laws of Colorado reads as follows:

> **Should the chief inspector have reason to believe that any mine foreman is unfit for his position he shall so notify the owner. If the owner continues the man in his position, the chief inspector shall then request the examining board to revoke the certificate of such official.**

In this connection I want to ask two questions: (1) Where, in the mining laws of Colorado, does the state mine inspector get his authority to demand that the certificates of all mine officials shall be "posted in the office of the company for inspection"? Sec. 40 of the same mining laws states, "The board of examiners shall file in the chief inspector's office a list of names of successful candidates."

The same section provides, further, that the examining board shall issue certificates of competency to all candidates who pass a successful examination and give satisfactory evidence that they fulfill the requirements of the law and are eligible to take the examination. As far as I have been able to find, however, nowhere in the law is the requirement made that the certificates of mine officials be "posted in the office of the company for inspection." If the inspector has in his office a record of the men who hold certificates of competency, I cannot understand why there should be any necessity of having these certificates posted in the office of the company.

(2) Again referring to Sec. 43 of the Colorado mining laws quoted above, I want to ask, Is the provision of this section authorizing the chief mine inspector to "request the examining board to revoke the certificate of such official," who he believes is unfit to hold the position he occupies, a just requirement? Would it be fair to revoke a man's certificate without giving him a hearing?

Lafayette, Colo. COLORADO MINER.

We believe there is no provision in the mining law of the State of Colorado, that can be understood as giving the state coal-mine inspector authority to demand the posting of the certificates of mine officials in the office of their respective companies. We do not know that this is generally required by Chief Mine Inspector Dalrymple, who has a reputation for fairness and is an intelligent, painstaking and efficient inspector fully acquainted with the duties of his office.

The basis of our correspondent's statement is found in the letter published in *Coal Age,* Oct. 28, p. 729. The writer of that letter cites an instance where he says the demand was made in writing that "on and after a certain date, every official engaged at the mine must have his certificate posted up in the office of the company for inspection."

In answer to the second question asked, it is safe to say that while the mining law of Colorado authorizes the chief mine inspector to request the examining board to revoke the certificate of a man who, in his opinion, is incompetent, it would seldom occur that the chief inspector would take such action without first notifying the party in question and explaining to him his reasons for such action.

There can be no question but that the judgment of the chief inspector should be the court of last resort in respect to the competency of mine officials holding certificates received from the examining board. It will generally be admitted that the mere holding of a certificate is no guarantee of the practical ability of the candidate to perform the duties of his office in a manner satisfactory to the inspector. We shall be glad to have the opinions of our readers in this regard.

Examination Questions

Tennessee Mine Foremen's Examination Held Oct. 9-12, 1916

(Selected Questions)

Ques.—If you were acting as fireboss and had an entry driven 200 ft. ahead of the last breakthrough, and found, in your examination, that this entry contained explosive gas back 100 ft. from the face, how would you proceed?

Ans.—No entry should be driven 200 ft. ahead of the last breakthrough, unless provided with a special line of brattice that would carry the air current to the face of the entry. The conditions described in this question cannot be supposed to exist in a properly managed mine.

Ques.—In driving entries where large volumes of gas are given off, what precautions would you adopt to insure the safety of the workmen, and how would you prevent the accumulation of gas at the face?

Ans.—Only experienced men must be employed and the best type of safety lamps used. Brattices should be erected to carry the air current forward so that it will sweep the face of each entry in sufficient volume to prevent the accumulation of gas. All holes should be charged and fired by competent shotfirers and only permissible powders should be used in blasting. Only single shots should be fired at one time, in the same place, which should be thoroughly examined after the firing of each shot and the brattice restored as quickly as possible if destroyed by the force of the blast. In this way only can the place be worked with safety and the accumulation of gas prevented.

Ques.—If you were foreman of a mine generating gas, and an accumulation of firedamp had collected on the falls, what method would you adopt to remove it?

Ans.—First, withdraw all persons working on the return of the current sweeping the place. Then select men experienced in the handling of gas and equipped with good safety lamps and instruct them to erect a special brattice of canvas so as to deflect the air current to the top of the falls. Allow ample time for the air to sweep away the gas and make tests, from time to time, to ascertain the progress of the work. Care must be taken to shield the lamps as much as possible from a rush of gas caused by an unexpected fall taking place.

Ques.—What particular dangers are there in pillar drawing in a mine giving off explosive gas?

Ans.—Where the gas is coming from the roof, there is danger of a sudden increase in the outflow of gas following a fall of slate. The pressure of the gas may be such as to increase the danger from roof falls and make the drawing back of the pillars more hazardous. A similar danger exists, but to a less extent, when the gas comes from the floor of the seam, especially if the gas is confined under considerable pressure.

Ques.—State the causes of sudden outbursts of gas in coal mines and say what, in your opinion, should be done to prevent accidents from this cause?

Ans.—Sudden outbursts of gas are of more frequent occurrence in certain localities where the gas exists under considerable pressure. If it comes from the roof, the extraction of the coal and the consequent settlement of the roof strata allows the gas to accumulate in the interfoliated spaces formed between the strata or above the roof slate. The pressure of the gas is then exerted over a large area and a sudden fall of roof is liable to occur. A similar danger exists when the gas accumulates in crevices or fissures behind the coal face or in the rib when the pressure of the gas, again exerted over a large area, will often throw down great quantities of the coal. Such falls of roof or coal are accompanied with the outburst of large volumes of gas that fill the workings.

To prevent sudden outbursts of gas under these conditions, it is necessary to drive narrow places or stalls, with wide pillars between them. This gives an opportunity for partly draining the gas from the strata and relieving the pressure. A further precaution is to drill holes up into the roof at short intervals. Holes should also be bored in the ribs and the coal face to drain the gas from the coal.

Ques.—What are the essential features of a safety lamp?

Ans.—Following are the essential features of a safety lamp for testing for gas: A free circulation through the lamp so as to provide the same gaseous condition in the combustion chamber as exists in the atmosphere surrounding the lamp and insure a reliable test of the mine air. The lamp should be protected, first, against strong air currents or a sudden blast of air and, second, against the transmission of flame through the top of the lamp or the gauze chimney. An important requirement of a good testing lamp is a reliable means of measuring the height of flame cap produced and observing the same clearly.

The essential features of a good working lamp for use in gas are the following: The lamp should possess good illuminating power and be provided with a strong, clear glass well protected from injury by an external blow. The circulation within the lamp should be ascensional and the feed air enter the combustion chamber at a point below the flame. The lamp should be provided with a double-gauze chimney and a good bonnet, to afford needed protection against a sudden inrush of air at the top of the lamp and the transmission of flame through the gauze chimney, which might occur as the result of a light internal explosion within the lamp.

A good working lamp should be simple in construction and its parts made so dependent on each other that no one part can be omitted by accident in putting the lamp together. The lamp should be designed to burn a good quality of cottonseed oil and provided with a suitable lock that will show any attempt to tamper with the fastenings. The lamp should be portable and as light as is consistent with substantial construction. It must be capable of withstanding severe handling in the mine without material injury to any of its parts.

Coal and Coke News

Washington, D. C.

Conservation measures make up an important part of the legislation which President Wilson is now attempting to put through Congress before it expires by constitutional limitation on Mar. 4 next. For the moment, however, this legislation is blocked by the deadlock between oil land leasors of California and the Navy Department. The President is seeking to break this deadlock, and some of the leaders in Congress still expect that this will be done. In the meantime Senator Myers has reported favorably from the Senate Committee on Public Lands the bill to amend the act providing for agricultural entries on coal lands. This may be put through in the last "jam."

The new bill would amend the old act so as to read as follows:

"Section 1. That from and after the passage of this act unreserved public lands of the United States, exclusive of Alaska, including surplus lands in any Indian reservation heretofore or hereafter opened to settlement and entry, which have been withdrawn or classified as coal lands, or are valuable for coal, shall be subject to appropriate entry, selection, or sale under any of the nonmineral public-land laws applicable to the particular lands desired if not containing coal, and to withdrawal under the Act approved June 17, 1902, known as the Reclamation Act, whenever such entry or withdrawal shall be made with a view of obtaining or passing title with a reservation to the United States of the coal in such lands, and of the right to prospect for, mine, and remove the same: Provided, that those who have initiated nonmineral claims under the public-land laws in good faith prior to the pasage of this act on lands withdrawn or classified as coal lands may perfect the same under the provisions of the laws under which said claims were initiated, but shall receive the limited patent provided for in this act.

Sec. 2. That any person, state, or corporation desiring to make entry or selection under any nonmineral public-land law of lands withdrawn or classified as coal lands, or which are valuable for coal, shall state in the application for entry or selection that the same is made in accordance with and subject to the provisions and reservations of this act, and the Secretary of the Interior, in withdrawing under the reclamation act lands of this character, shall state in the notice of withdrawal that such withdrawal is made subject to the provisions and reservations of this act.

Sec. 3. That upon satisfactory proof of full compliance with the provisions of the laws under which the entry or selection is made, and of this act, the entryman or selector shall be entitled to a patent or to a certification, as the law may require, to the land entered or selected, which patent or certificate shall contain a reservation to the United States of all the coal in the lands so patented or certified, together with the right to prospect for, mine, and remove the same. The coal deposits in such lands shall be subject to disposal by the United States in accordance with the provisions of the coal-land laws in force at the time of such disposal: Provided, that the proceeds arising from the disposal of such coal deposits in surplus Indian lands opened to settlement and entry shall be deposited in the Treasury of the United States and shall be applied in the same manner as the proceeds arising from the disposition of the surface lands therein. Any person qualified to acquire coal deposits or the right to mine and remove the coal under the laws of the United States shall have the right at all times to enter upon the lands selected, entered, or patented, as provided by this act, for the purpose of prospecting for coal thereon upon the consent of the surface entryman or owner, or upon the approval by the Secretary of the Interior of a bond or undertaking to be filed with him as security for the payment of all damages to the crops and improvements on such lands by reason of such prospecting. Any person who has acquired from the United States the coal deposits in any such land, or the right to mine or remove the same, may reënter and occupy so much of the surface thereof as may be required for all purposes reasonably incident to the mining and removal of the coal therefrom, and mine and remove the coal, upon payment of the damages caused thereby to the owner thereof, or upon giving good and sufficient bond or undertaking in an action instituted in any competent court to ascertain and fix said damages: Provided, that the owner under such limited patent shall have the right to mine coal for use upon the land for domestic purposes at any time prior to the disposal by the United States of the coal deposits: Provided, further, that nothing herein contained shall be held to deny or abridge the right to present and have prompt consideration of applications to locate, enter, or select, under the land laws of the United States, lands which have been classified as coal lands with a view of disproving such classification and securing a patent without reservation."

Few Fatalities in 1916

With one fatality for each 269,000 tons of coal mined, a new low record was established in the United States in 1916. This compares with one fatality for each 234,000 tons of coal mined in 1915. Fatalities in 1916 were two per cent. less than the showing made in 1915, in which year they were the lowest recorded since 1898.

Complete figures have been just compiled by Albert H. Fay, statistician of the Bureau of Mines. His tabulation will show that 2208 men were killed in coal mining operations during the year just passed. His total is qualified by the fact that November and December figures have not been received from Kentucky. It is known, however, that there were no disasters in that state during those months, but it is possible that a few isolated deaths may have occurred, which will add slightly to the total, but will not appreciably affect the percentage.

Expressed in another way, there were 3.72 men killed per million tons of coal mined in 1916, as compared with 4.27 fatalities per million tons in 1915. An unusual coincidence, in comparing the statistics of the last three years, is that there have been eleven mine disasters in each of these years. The disasters in 1916 were comparatively less destructive to human life, the largest resulting in 30 fatalities.

Potent causes for the reduction of the death rate, Mr. Fay states, are the desire to secure better insurance rates, the influence of the compensation laws, the increasing vigilance of inspectors and the wider dissemination of knowledge with regard to safety practices, which is being carried forward on an increasing scale by the Bureau of Mines.

HARRISBURG, PENN.

The Legislature convened on Jan. 22, after a three weeks' recess, and on that date, James Maurer, president of the Pennsylvania Federation of Labor, introduced a bill providing for the establishment of an Old Age Assistance Bureau to be conducted under the supervision of the Commissioner of Labor and Industry.

When this act shall have come into operation it will become the legal right of all persons of either sex over the age of 60 years, who shall then or at any time thereafter be unable to work and are without means of livelihood to make application to the proposed bureau for a weekly stipend of $5 from the sum to be appropriated for the use of the Old Age Pension Bureau. Where a man and wife living together shall be both over 60 years of age and shall apply for assistance the joint allowance shall be $8 per week.

An alien applicant for an old age allowance who cannot prove his or her age shall be deemed to have qualified if he or she shall establish the fact of having been a resident of the United States for 50 years, 10 years of which shall have been spent in the State of Pennsylvania.

An appropriation of $500,000 is asked for to carry out the provisions of the act for the two years succeeding its passage.

Mr. Ramsay has introduced a bill to regulate the operation of certain steam engines and steam boilers, and that all engineers be licensed by the state.

The bill applies only to engines and boilers which are operated by steam and which are of greater than 25 hp. The terms do not include locomotive boilers or locomotive engines or steam boilers carrying less than 15 lb. pressure nor do they include marine engines licensed under Federal laws.

The bill reads that it shall be unlawful to operate or cause to be operated any steam engine or boiler except by a licensed engineer.

Licenses required by the act are to be valid only for one year from issuance. No person is to be granted a license to operate a steam engine or steam boiler unless the following conditions are complied with: (a) Application must be made in writing to the district examiner; (b) the applicant must be over 21 years old; (c) the applicant must furnish proof satisfactory to the examiner that he has been employed about steam engines and steam boilers at least two years immediately prior to the date of application. The fact of such employment must be certified to by at least one employer and by at least two engineers of not less than five years' experience.

The bill further provides that if an applicant has been employed as a steam engineer for a period of three years immediately prior to the date of approval of the act, with a certificate from his employer corroborating the same a license shall be granted without examination, upon payment of the annual license fee.

In case of absolute emergency an employer may employ other than a licensed engineer in the operation of a steam engine or steam boiler. Such employment shall not be for a period exceeding ten days.

Whether or not the operators will object to this bill has not been learned, but it is presumed that they will ask a hearing of the committee.

Physicians to Organize

For the purpose of establishing an organization of surgeons who are particularly interested in the work of the compensation departments of the numerous coal companies throughout the anthracite region, Dr. S. P. Mengel, chief surgeon of the Lehigh Valley Coal Co., has invited all the leading coal-company doctors and other prominent physicans to attend a meeting at Wilkes-Barre.

The purpose of the new organization will be to promote the common interest of those surgeons who are specially engaged in handling accident cases and the welfare work of the anthracite operators. Having a special field of its own, the new association will not in any way conflict or interfere with the work of the old organizations or the county Medical Societies, in fact a wholesome coöperaiton is looked for that will benefit the medical profession in general.

An interesting decision has been given by one of the referees in the Compensation Bureau of the state, in which he holds that compensation is based on the wage scale plus the bonus.

In the case decided by the referee, an employee of the Aetna Explosives Co. had been receiving compensation based on weekly earnings of $16.83, according to an agreement with the company, but he later claimed compensation on a basis of $26.88 a week, which included bonuses paid by the company. The referee allowed him $10 a week during disability.

In allowing additional compensation due to bonuses paid an interesting question has been raised and the Compensation Board will no doubt be appealed to for a decision on this point.

Three Important Decisions

The Supreme Court, on Jan. 22, handed down decisions in three mine-cave cases and in each case the opinion of the Lackawanna Court was affirmed.

Justice Walling wrote the three opinions which will go far toward clarifying the mine-cave situation and make more certain the remedy that will have to be applied.

Three different phases of the mine-cave menace were involved in the cases which were known by the following titles:

Commonwealth ex. rel. John D. Keator and George H. Brown, appellants, vs. Clearview Coal Co., City of Scranton, appellant, vs. Peoples Coal Co., City of Scranton, appellant, vs. Scranton Coal Co., and Elk Hill Coal and Iron Co. All the cases were argued in Feb., 1916.

In the first named case the attorney general of the state at the instance of the school district and certain citizens of the school district of Scranton sought to prevent mining by the Clearview Coal Co., on the ground that it was damaging No. 40 school building and endangering the lives of the pupils.

The Supreme Court affirming the lower court decides that the company has the right to mine the coal it owns, since the school district waived the right to surface support when the land on which the building rests was purchased and that to secure support it must by condemnation proceedings acquire and pay for the coal.

In the opinion Justice Walling says: "The mining of coal is lawful and, whereas, in this case, the right to surface support is expressly waived, it is lawful to remove all of the coal. An order of court that says coal or part of it must remain permanently unmined as a support to the school building practically takes such coal from the defendant and vests it in the school district. It would in effect be a taking of private property for public use without compensation, which the constitution forbids."

In the case of the City of Scranton against the People's Coal Co. the right to mine coal under one of the main streets is involved.

The Supreme Court decides that since the company secured the right to mine coal from the abutting property owners, it acquired the coal to the center of the street and can take such coal as will not interfere with the use of the

highway. The lower court held that 50 per cent. of the coal could be mined and that future mining under the street should be supervised to see that sufficient support is left. That decision is affirmed by the Supreme Court.

In this opinion, Justice Walling says: "The title to property abutting a public street extends to the center of the street, and the owner thereof is entitled to all the minerals therein, with the right of removal as long as he leaves the street intact. But the abutting owner cannot remove mineral from under or adjacent to an established highway in such manner as to cause a subsidence or other injuries thereof. To do so is a nuisance which in a clear case will be restrained in equity at the suit of the municipality. A street is entitled to such support as will keep it in place, both lateral and vertical. Here the chancellor finds that 50 per cent. may be safely taken from under the avenue and so decrees."

The third case was a result of the passage of the Davis mine-cave act by the legislature of 1913. The Davis act permitted the creation of a bureau of mining in municipalities of the anthracite region, and the head of the bureau in Scranton, recommended that mining by the Scranton Coal Co. and Elk Hill Coal and Iron Co. was endangering certain streets in Green Ridge. An injunction to prevent further mining was asked by a number of property owners.

Judge Newcomb of the Lackawanna county court refused to grant an injunction under the facts shown and his position is sustained by the Supreme Court. The constitutionality of the Davis Mine-Cave Act is not touched upon.

The decisions rendered by the court are said by leading lawyers to cover nearly all the points at issue in the mine-cave cases now before the lower courts.

PENNSYLVANIA

Anthracite

Mahanoy City—Twelve men were rescued in an unconscious condition by a helmet crew on Jan. 26, in a smoke-filled gangway in the Glendon section of the Primrose mine. The rescuers wearing helmets found the men scattered at irregular intervals along the gangway, and half dragged, half carried them out of the danger zone. It is believed that all these men will recover. A fire was discovered in this mine on Jan. 23, and the men overcome and rescued consisted of two exploration parties who entered the mine in an attempt to get close to the fire.

Nanticoke—One man was killed and another had a narrow escape from death on the night of Jan. 27, when the breaking of a rope dropped a carrier bucket down the old Dundee shaft of the Loomis colliery of the Delaware, Lackawanna & Western Railroad Co. The men had been engaged in bailing water from the bottom of the shaft and were being hoisted to the surface when the rope broke. Fellow workmen lowered a rope with chain attachments and after a time received an answering jerk on the rope. They slowly pulled the rope and one of the men came to the surface with just enough strength remaining to cling to the chain, which he had wrapped about his waist. He fell about 300 ft.

Shenandoah—All the Packer collieries of the Lehigh Valley Coal Co., were compelled to suspend work on Jan. 26, for want of railroad cars. This threw thousands of men and boys idle.

Coleraine—Carrying with it the Lehigh Valley R.R. tracks on the Beaver Meadow division, a cave-in occurred at the mines of the A. S. Van Wickle estate on Jan. 22. All trains had to be sent over another route, until the hole was filled up.

Plymouth—Officials of the Delaware & Hudson Co., have decided not to replace No. 3 breaker destroyed by fire on Dec. 2, last. The company will run the coal through No. 5 breaker, now the only one remaining of five operated at one time here. The company has a force of men at work building a narrow gague railroad from No. 5 breaker to No. 3 shaft and from No. 3 to the Boston workings, the latter being an emergency line. It is the intention to provide permanent employment for all old hands without a decrease in wages and as many as possible at similar work.

Bituminous

Marion Center—D. F. Rinn of Indiana has purchased a large tract of coal land in the vicinity of Rossmoyne, Indiana County, along the line of the Buffalo & Susquehanna R.R. No plans have as yet been announced for the development of the property.

Franklin—The mines of the Cambria Steel Co. have produced more than 1,000,000 tons of coal, mining men estimate in completing the 1916 report to be filed with the State Mine Inspector of the district. This represents an increase over last year, and will cut down the decrease in tonnage for the district. The tonnage of the Berwind-White Coal Mining Co. will also show an increase over that of 1915, it is estimated. Neither the Cambria nor Berwind-White companies had to contend with car shortage or labor troubles and the mines worked to capacity throughout the year. The majority of mines in Somerset County will show a decrease, due principally to the car shortage and numerous strikes.

Pittsburgh—Mine Inspector Thomas S. Lowther of Indiana, secretary of the Mine Inspectors Advisory Association has issued a call to the members of the Mine Foremen's and Fire Boss' Examining Boards of the bituminous inspection districts to meet in Pittsburgh on Friday, Feb. 23, for the purpose of selecting a committee to formulate questions and set the dates for the next annual examination.

Homer City—The Meco Coal Co., one of the J. Blair Kennerly interests, has opened a mine in the Upper Freeport seam, the coal from which is conveyed by means of an inclined plane about 700 ft. in length to the same tipple, over which the coal from the No. 1 mine, opened in the "B" seam, is dumped. About 25 houses have been erected and the Pennsylvania Colliery Supply Co. has opened a store. The mines are located about three miles from Homer City on the Snyder to Possum Glory Branch of the Pennsylvania R.R.

Indiana—Deeds have been recorded here transferring the coal lands of the Saltsburg Coal Co. in Young Township to Lucius W. Robinson, president of the Rochester & Pittsburgh Coal and Iron Co. The first transfer involves over 1080 acres and the second over 539 acres. The purchase price is said to be about $125 per acre. The field is situated in the Saltsburg district in the southwestern end of the county, and adjoins the coal which this company recently purchased from the Kent Coal Co.

Indiana—The Jefferson & Clearfield Coal and Iron Co. is opening a large acreage at Kent. The new opening is well under way, and will be electrically equipped throughout, the power to be furnished by the central power plant of this company at Lucerne.

Greensburg—The coal shippers of this vicinity are preparing plans for an organization to carry a fight for better car supply to the Public Service Commission. This commission on Jan. 25, heard arguments on objections filed by the numerous coal operators in the bituminous region against the proposed amendment to the tariff of the Pennsylvania R.R. to permit it to refuse coal cars to those loading from wagons or in any other way than from tipples. Over 260 persons have joined in the case and many letters have been sent to the commission.

McIntyre—Estep Brothers who sold their mine at Sides Station to the Pennsylvania Coal and Coke Corporation have leased the Lowman coal adjoining the property of the Coal Run Mining Co. Engineers have completed their work of laying out the siding, etc., and operations will be started at once. The Estep Brothers are also taking options on a large tract on the Buffalo & Susquehanna near Sagamore.

Connellsville—Emulating the example of the Pennsylvania, the Baltimore & Ohio Railroad Co., on Jan. 23, notified small coal shippers that hereafter they would be limited to box cars. The order affects 125 to 150 shippers who load cars by teams on the Connellsville division lines between Connellsville, Cumberland, Fairmount and Johnstown.

The estimated production of coke for the week ending Jan. 20 was 347,490 tons of which the merchant ovens produced 130,860 tons, or a decrease of 6192 tons from the preceding week, and the furnace ovens made 216,630 tons, or an increase of 490 tons. Shipments for the week all by rail aggregated 346,823 tons.

Savan—The Savan Colliery Co. is erecting ten additional houses here for the workmen of the Savan No. 1 mine.

Valier—The Perry Coal Co., owned by the Winslow estate of Punxsutawney, was sold last week to Vernon F. Taylor of Indiana. It included the coal, plant and equipment and town. The present output is 400 tons daily but after Mr. Taylor completes the improvements the output will be doubled. It is located on the B. R. & P. Ry.

WEST VIRGINIA

Fairmont—The Consolidation Coal Co. is completing plans for the building of a number of additional company houses at its Monongah mine. A large number of laborers have been brought to the town during the past few weeks, and until the new houses are completed these will be considerably inconvenienced for living quarters.

Tralee—The Wood-Sullivan Coal Co. has under construction 20 new houses, and is increasing the capacity of its mine to over 350 tons a day.

Charleston—The Charleston Domestic Coal Co. has purchased the Black Hawk mine. The company is installing new equipment to develop the property which will load coal on the Kanawha & Michigan R.R.

Huntington—Connor & Stiles recently announced the purchase of an additional 300-acre tract of Eagle coal on Coal River near Clothier. This adjoins the tract recently leased by this firm to the Monte Mining Co.

Bluefield—Coal operators along the Norfolk & Western Ry. were recently officially notified that the road is now experiencing the worst coal car shortage in its history. The car supply it was stated is at present but 50 per cent., while the movement of traffic at Western connecting terminals continues to be slow. Every possible agency, it was stated, had been put to work by the railway to ameliorate the car situation, but conditions on the Western connections was such that the return of empties was practically at a standstill.

Wellsburg—A pier erected by the McKinley Coal Co., in Buffalo Creek, near the mouth of Pitt's Run, to support a bridge, was washed away recently by the waters of the creek. The bridge pier will have to be rebuilt before the bridge across the creek to the coal tipple can be erected.

Wheeling—Fire of undetermined origin recently destroyed the fanhouse and part of the tipple of the Parrs Run Coal Mine near Moundsville, causing a loss of $5000. Three men were slightly injured in fighting the flames. A gang of carpenters was immediately put at work repairing the damage.

KENTUCKY

Fleming—Two transportations of miners recently arrived in Fleming and Haymond where they will be employed in the mines of The Elk Horn Coal Corporation. The operating companies of eastern Kentucky now experience little trouble in holding miners.

OHIO

Zanesville—The Sunday Creek Coal Co. mines have been badly handicapped on account of a scarcity of labor. A force of about 50 men from Pennsylvania has been brought to San Toy recently. This however will furnish only partial relief from the situation, as at least twice this number of men will be needed immediately.

Columbus—Embargoes go and come in the coal traffic situation in Ohio territory. Shippers from the Hocking Valley have been having their troubles until a point has been reached where few lines are open. A week ago a number of embargoes were announced at Toledo and most of the Michigan lines were closed. Since that time some changes have been made in the situation with the Ann Arbor now open for coal traffic. The Nickel Plate is also open as is the Akron division of the Pennsylvania and the Erie, west of Marion. Embargoes are still in force on the Michigan Central, the B. & O. at Fostoria; the Pennsylvania at Columbus; the Pere Marquette with the exception of shipments to Detroit where consignees have private sidings; the Big Four at Cleveland; the Erie east of Marion and the D. T., & I. at Detroit.

INDIANA

Bruceville—The Bruceville mine of the Oliphant-Johnson Co., after having been sealed up since the explosion on Christmas Day, was opened on Jan. 24 by H. R. Smith of the Bureau of Mines, with his crew of inspectors from the Government service, who made their descent into the mine. When the seal was broken a large volume of gas came up from the shaft, but it was only a short time until the mine was ready for inspection. Two parties of five men each went down, and from unofficial sources it was learned that conditions were found better than expected. It is said that the mine will be in operation with a full crew of men within two weeks' time. This disaster cost the lives of two men, and two others later died of their injuries. Three hundred and two men were employed when the accident occurred, and experts consider it marvelous that so many escaped with their lives. Fifty-six men were more or less injured.

Indianapolis—Railroads were recently ordered by the Indiana Public Service Commission to give preference to coal shipments throughout the state over all other classes of freight except live-stock, and prohibitory reconsignment charges will be put in force. This order will be in effect for 10 days, during which period coal cars must be used for no other purpose than that of hauling coal. Empty cars must be returned to the mines with the same dispatch with which coal cars are handled. The high reconsignment charges will be in effect for 60 days, and no more than two reconsignments will be allowed.

ILLINOIS

Panama—A serious fall was caused by a motor jumping the track in the Panama mine a few days ago. The motor knocked out some timbers, which let down a large mass of roof. W. I. Williams and Alva Mills, who were on the motor, were pinned down by the coal for an hour. Williams was sent to a St. Louis hospital with a broken leg. Mills is under treatment at his home.

Springfield—The bill that has been drafted for the consolidation of various state departments provides that the Department of Mines and Minerals shall have a director, an assistant director, a superintendent of safety and three mine examining commissioners.

Niantic—The Niantic Coal Co. has resumed operation of the shaft which was abandoned three years ago by the Decatur Coal Co. Improvements will be made, including a new steel tower and a boiler room. The Niantic company is composed of local business men.

Middletown—An offer of the Johnson Valley mine near here to sell coal for $2 a ton at the mine has brought an extraordinary wagon trade. The mine supplies practically everybody within a radius of 15 miles and some come greater distances. It is necessary to turn away 40 or 50 wagons every day. One morning re-

cently about 50 wagons were lined up at 3 o'clock waiting to be loaded.

Danville—Night raids on coal trains enroute from the mines south of Danville to Chicago on the Chicago & Eastern Illinois R.R. have become so frequent that the railroad company has been forced to put guards on the trains. Twenty persons attacked a train a few nights ago. The guards fired on them, wounding two.

Murphysboro—No. 10 mine of the Big Muddy Coal and Iron Co. has been almost continuously idle for the past few weeks on account of the refusal of the M. & O. R.R. to furnish equipment. This has practically eliminated Big Muddy coal from this field for the past few weeks.

Mine No. 9 of the Big Muddy Coal and Coke Co., which has been shut down for three weeks on account of high water in the Big Muddy River, has resumed operations, it having been decided that it was safe to let the men go below. This mine extends under a portion of the Big Muddy River. When the water is high it frequently floods a section and endangers the lives of the miners.

Bush—Preparations are under way for the erection of the tipple for the new mine of the Western Coal and Mining Co. just over the line in Franklin County, northeast of here. The main and air shafts are sunk, and the mine is being pushed on entry work. It is expected that the old workings here will be abandoned when the new mine opens.

Foreign News

Berne, Switzerland—The crisis arising from the German decision to abrogate convention in regard to imports is increasing in gravity throughout Switzerland daily. The political department has decided to take a census of all stocks of fuel and any concealment will be punished by imprisonment and a fine. Gas companies have been authorized to fix the amount of gas each consumer may burn daily, and the iron and steel trade will henceforth be under the supervision of the political department.

Personals

William D. Leeds, of No. 1 Broadway, has been appointed New York sales agent for The Brailer Mining Co. of Mt. Savage, Md., miners of George's Creek Big Vein coal.

Edward L. Williams has been promoted to superintendent of The Elkhorn Coal Co. in place of J. Henry Hall recently resigned. S. L. Bastin of Lexington becomes general manager.

M. L. Jarrett, has resigned as chief engineer of the Pond Creek Coal Co., to take a similar position with the Turkey Gap Coal and Coke Co., at Dott, W. Va. He is succeeded by C. W. Stafford.

R. M. Hosler was recently appointed supervisor of coal mines schedule ratings under the general supervision of the Insurance Department of Pennsylvania. This appointment became effective on or about Feb. 1, 1917.

Thomas Townsend, recently resigned his position as mine foreman at the Victor No. 29 mine at Clymer, Penn., of the Russell Coal Mining Co. and has accepted a similar position with the Pennsylvania Coal and Coke Corporation at Moss Creek.

George Haldman, mining engineer for many years with the Lehigh & Wilkes-Barre Coal Co., now has a like position with the C. M. Dodson Co. at Beaver Brook, Morea and Locust Mountain collieries. He succeeds Edward Cortright at Mauch Chunk, who is on the Mexican border.

Joseph A. Smith, who has been successively superintendent at the Gilchrist and Collier mines of the West Virginia-Pittsburgh Coal Co., has been transferred to the La Belle mine of the company, to succeed John G. MacMahon, appointed a deputy state mine inspector. Mr. Smith's successor at Collier, W. Va., has not been named.

George T. McCarty has been appointed Western Sales Manager of the United Coal Corporation, with headquarters in the general offices of the company, First National Bank Building, Pittsburgh, Penn. William J. Bailey has been appointed Eastern Sales Manager, with headquarters in the Pennsylvania Building, Philadelphia, Penn.

George L. Eaton, vice-president in charge of sales, of the Rochester & Pittsburgh Coal and Iron Co. with offices at Rochester, N. Y. will sever his connection with that company Mar. 15 to go into private business. Mr. Eaton will be succeeded by Charles E. Buchholtz, vice-president of the Northern New York Coal Co. of Watertown, N. Y.

William H. Bennett, advertising manager of the Searchlight Co., Karpen Bldg., Chicago, has joined the forces of the Service Motor Supply Co., 15th St. and Michigan Ave., Chicago. This action is due to the consolidation of the Searchlight Co. with the Air Reduction Co. of New York City, and the removal of the Searchlight interests to the eastern city.

Eugene McAuliffe, general fuel agent of the Frisco system at St. Louis, has resigned to become vice-president and general manager of the West Kentucky Coal Co., with offices at Paducah, Sturgis and Louisville. His assistant, Charles E. Reed, has also resigned to take a position as secretary of the West Kentucky Traffic Bureau. Mr. Reed's office will be at Madisonville, Ky.

G. B. Johnson was recently appointed to take charge of the Wilkes-Barre, Penn., office of the B. Nicoll & Co., of New York City. He will take care of the shipping end of the firm's anthracite business. This firm has also been appointed general sales agent for the Kehota Mining Co., operating in the Hocking Valley, the Tunnell Coaling Co., and the Unity Coal Co., operating in Pennsylvania.

W. C. Huber, of Pittsburgh, Penn., has resigned as general manager of sales of the United Coal Corporation, and has returned to Philadelphia, and is operating an office as a coal broker, where he will handle the output of the mines of the Arrow Coal Mining Co., in Somerset County, in which he is interested, as well as other coals. No successor to Mr. Huber will be appointed at present.

James Pritchard, chief deputy and safety commissioner of the Ohio Mining Department, recently resigned, the resignation to take effect Jan. 15, but this resignation has not yet been accepted. Mr. Pritchard will take a position with the Southern Ohio Coal Exchange as commissioner, his work including the adjustment of wage differences, and all matters pertaining to compensation, and securing membership of the association.

John L. White, superintendent of the Eleanora Mines of the Rochester & Pittsburgh Coal and Iron Co. resigned his position to accept the superintendency of the mines of the Penker Coal Co. on the Martins Branch of Pennsylvania R.R. near Portage, Penn. A. W. Calloway, president of the Davis Coal and Coke Co. of Baltimore recently purchased all the stock of the Penker Coal Co. and extensive improvements are contemplated.

Industrial News

Hazard, Ky.—In order to meet the demands of the coal fields around Hazard the Kentucky River Power Co. is increasing its transmission lines and making extensions. The third turbine is being installed.

Leetonia, Ohio—The United Iron and Steel Co., operating the Cherry Valley furnaces, has leased 400 acres of coal lands near Leetonia, and is preparing to make an opening near the furnaces which will in future be supplied with both coal and coke from this new mine.

Pittsburgh, Penn.—The Randolph-Means Co. has undertaken the electrification of a new shaft mine to be opened up by the Maple Glen Coal Works near Brownsville, Penn. This mine will use purchased power and modern equipment will be used throughout.

Harrisburg, Penn.—Governor Brumbaugh has appointed the following as the Board of Examiners of Bituminous Mine Inspectors at the examination to be held this spring in Pittsburgh: George S. Baton, Pittsburgh; Robert H. Kay, Saxton; E. A. Watters, Leechburg; William H. Gates, Graceton, and Stephen Arkwright, Mount Pleasant.

New York, N. Y.—Commissioner of Accounts Wallstein on Jan. 30 submitted a report to Mayor Mitchel showing that inspectors connected with his office on the previous Friday and Saturday had located betwen 50,000 and 60,000 tons of coal of various sizes and grades at the various terminals near the city. This report is to be followed by others.

Harrisburg, Penn.—The State Insurance Fund Board, on Jan. 29, appointed Malcolm MacDougall as inspector of mining operations for the State Fund, which insures mining risks. He will enter upon his duties at once and have headquarters at Johnstown. Mr. MacDougall is a mining engineer and had charge of several bituminous mines in the central and northern counties.

Harrisburg, Penn.—The plan of the Pennsylvania R.R. to amend its traffic rules so as not to allow the loading of any coal except over a tipple has been blocked by the Public Service Commission. Had the proposed amendment gone into effect it would have closed many of the smaller operations which are now loading by means of hauling by wagon to a public railroad siding.

New York, N. Y.—The Babcock & Wilcox Co., well known builders of several types of water-tube boilers, recently adopted the Diamond mechanical soot blower as standard equipment for all boilers it builds. This apparatus is built by the Diamond Power Specialty Co., of Detroit, Mich. The decision of the B. & W. Co. was reached after a thorough test of apparatus of this kind at present on the market.

Wilkes-Barre, Penn.—Since the expiration of old contracts for supplies with the beginning of the new year coal companies are feeling the pinch of advancing prices of paper, pencils, typewriter ribbons and other supplies. Auditors are insisting on the return of the stumps of pencils when requisitions are made for others, and old typewriter ribbons must be sent in for inspection after fresh ones are issued.

Columbus, Ohio—The contempt charge bought against John H. Winder, receiver for the Sunday Creek Coal Co., by the Continental Coal Co., in the federal courts has been dismissed. The officials of the Continental Coal Co. objected to certain business details carried out by Mr. Winder, after being named receiver and consequently filed the contempt charge. After an all-day's hearing the charges were dismissed.

Louisville, Ky.—A joint sales office has recently been established in this city by the Beech Creek Coal Co. and the Kirk Coal Co. This office is located at 515 Intersouthern Building, and will be conducted under the name of the Beech Creek and Kirk Coal companies. It will be in charge of J. N. Hershey, formerly of the Banner Coal Co., of Louisville, Ky., and O. W. Kirkpatrick, formerly of the Beech Creek Coal Co., at Beech Creek, Ky.

St. Louis, Mo.—The cheapness of fuel in the Mississippi Valley is the cause of the locating in St. Louis just recently of a large blast furnace, and a company has just been organized at Murphysboro, Ill., for the establishment of a steel plant there, also a glass factory. Another blast furnace company is being organized at Poplar Bluff, Mo. The cheapness of fuel and the advantage of using the iron ore from southern Missouri are the principal reasons for these industries.

Marion, Ohio—Heavy transfers of coal from the Pennsylvania R.R. to the Erie lines, bound for Chicago, have been effected during the recent past, in order to relieve the coal famine threatened there. On several days 500 cars of coal have been transferred. It is estimated that the Erie R.R. has approximately 800,000 tons of its own coal stored in yards at Marion, indicating the abundance of fuel in this vicinity. The coal being sent West is from the West Virginia fields.

Newport News, Va.—Captain Walter Wiley, of Thomaston, Me., and 13 of the crew of the schooner "Fannie Palmer," which was abandoned 500 miles east of Gibraltar on Dec. 6, have been landed in Boston by the White Star liner "Cretic." The schooner lost her rudder and was damaged in heavy weather while bound from here to Carthagena with a cargo of coal. The British steamship "Lady Plymouth," which took off the crew, attempted to tow the "Palmer" to Gibraltar, but the schooner soon filled and sank.

Columbus, Ohio—The affairs of the Continental Coal Co. under Receiver Nicholas Monsarratt are expected to be wound up in the near future by the filing of the last account and the discharge by the court of the receiver. Through the sale of its group of twelve or more Hocking mines, all assets have been disposed of. Formal transfer has not yet been announced by which the purchasers, the New York Central R.R., turns the mines over to the George M. Jones Co., of Toledo, which was the actual buyer.

Canton, Ohio—The Berger Manufacturing Co. announces the following appointments among others: R. W. Van Horn who for the past six years has been connected with the New York branch in charge of the metal lumber department has been transferred to the home office and placed at the head of the building material products division. Norman A. Hill, recently efficiency engineer for the Dupont Powder Co., Wilmington, Delaware, and formerly engaged in appraisal work for the Public Service Commission in Maryland, has been appointed efficiency engineer with headquarters in the home office.

Seattle, Wash.—The U. S. Bureau of Mines recently established on the campus of the University of Washington a Mines Experiment Station and in connection with its opening a smoker and open house was arranged by the College of Mines. Dorsey A. Lyon, superintendent of the station, and George Watkin Evans, mining engineer, gave short talks. Dr. Lyon stated that it is proposed that the work at the new station shall include the study of the coals of the Northwest and of the west and southwest of Alaska for the purpose of (a) determining how they may be mined with the least possible waste, and (b) how low-grade coals may be improved so as to render them suitable for fuels for all purposes.

Columbus, Ohio—H. S. Riddle, chief engineer for the state board of administration, proposed that the board mine for the use of its 22 institutions, the 7,250,000 tons of coal underlying the grounds of the Athens state hospital. While the state is paying from $2.60 to $5.5. a ton for soft coal, the two beds underneath the 960 acres in the Athens holdings contain enough coal to supply the board's institutions for 45 years, according to Mr. Riddle. By using prison labor for mining it the cost would be small. According to Riddle's statement to the board a bed 4½ ft. thick is struck at a depth of 120 ft. Down 30 ft. more is a second bed of 3½ ft. A spur soon to be built will connect the hospital grounds with two railroads.

Market Department

GENERAL REVIEW

Reading Co. puts out new anthracite circular Feb. 1. Spot bituminous market easier and contract situation uncertain. Uncertainty in transportation and fluctuating weather conditions create an unstable market. Middle West domestic trade going on a hand-to-mouth basis.

Anthracite—The demand is somewhat easier and it is purely a weather market from now on; moderate temperatures such as marked the most part of the current week will undoubtedly result in a sharp break should they continue while on the other hand the exhausted condition of the storage reserves, offers serious possibilities should weather conditions cause a heavy consumption. The unexpected announcemnt of a new circular by the Reading Co., effective Feb. 1, is puzzling the trade. The issuance of a new circular at this time of the year is unprecedented, and the only explanation is apparently that the companies contemplate obtaining all they can on certain sizes, which have been omitted, including lump, steamboat broken and the buckwheats, with a view to paving the way for increases on these sizes in the Apr. 1 circular. Railroad deliveries continue exasperatingly slow, and on the whole all branches of the trade will welcome the end of the season's business which has been an exceedingly anxious period for all concerned.

Bituminous—There has been a general easing off in the market in all directions with the possible exception of some of the very best grades. It is generally agreed that the peak of the advance in the bituminous market has been definitely passed unless there should be some very unusually severe weather between now and spring. The outlook on new contracts continues shrouded in considerable uncertainty, both buyers and sellers hesitating about committing themselves. Nevertheless, there is some tonnage being covered, and at gratifying increases over the old prices. Buyers are generally taking the initiative on contracts expiring immediately, while the reverse obtains on business coming up Apr. 1. Conditions in the export trade offer such favorable opportunities that local consumers will find themselves in aggressive competition with foreign interests. On current contracts additions of the increased wages granted the miners are being generally accepted by the consumers without complaint, particularly where the total price continues below spot quotations and deliveries are fairly reliable.

Lake Trade—A temporary lifting of embargoes in the Pittsburgh district over last week end stimulated heavy buying, advancing the market, though there was later a reaction when the embargoes were reinstated. With weather conditions fluctuating to both extremes and transportation conditions changing almost hourly, it is impossible to follow all the variations in the market. Generally, there seems to be an increased supply with an easier tendency, but on the other hand steam consumption continues on the same tremendous scale, while domestic consumers are still working on small margins, with reserves down to an irreducible minimum. Contracting is proceeding slowly, consumers hesitating to close at the high ruling figures because of the uncertainity as to the future. The leading interest in the Pittsburgh district is renewing old contracts on the basis of $3, though restricting the tonnage. Lake bunker contracts are being negotiated on the basis of $4 f.o.b. vessels, which works out at $3.02 at the mines. A number of railroads are making short-time contracts at greatly advanced figures.

Middle West—The market continues steady, but the tendency of the domestic trade to go on a hand-to-mouth basis is becoming more pronounced as the season advances. The congestion and transportation delays continue the dominant feature of the trade, and this is a potent influence in maintaining the high prices. Whether the market will score further advances before the spring reaction, hinges entirely on the weather and transportation conditions. Calls for Middle Western coal in the Northwest continue as insistent as ever, and that section will undoubtedly absorb any surpluses that may develop for some time to come. More interest is being shown in the contract situation as the season advances, though no definite figures have as yet been announced. It is agreed by all, however, that the position of the operating interests has never been more favorable.

A Year Ago—Slight easing up on anthracite due to high temperatures. Bituminous situation decidedly mixed and largely controlled by transportation facilities. Exports again increasing rapidly. Technically strong position in the Middle West markets.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	Feb. 3	Jan. 27	Jan. 20	Jan. 13	Jan. 6
Clearfields	*$2.35@2.60	$4.50@4.25	$4.75@5.60	$4.75@5.60	$4.75@5.60	$4.75@5.60
Cambrias and Somersets	*2.75@3.00	4.90@5.50	5.00@6.25	5.00@5.65	5.00@6.00	5.00@6.00
Pocah. and New River[1]	2.80@2.90	6.50@6.75	6.50@7.00	6.50@7.00	6.75@7.25	7.00@7.50
Philadelphia						
Georges Creek (Big Vein)	3.10@3.25	5.75@6.00	6.00@6.25	6.00@6.50	6.50@6.75	6.50@6.75
W. Va. Freeport	*2.05@2.15	5.00@5.15	5.00@5.25	5.25@5.50	5.75@6.00	5.75@6.00
Fairmont Gas mine-run	*2.10@2.15	5.25@5.50	5.25@5.50	5.25@5.50	5.50@5.75	5.75@6.00
Pittsburgh (steam coal)[2]						
Mine-run	1.50@1.75	4.70@4.80	4.50@4.75	4.25@4.50	4.00@4.25	5.00@5.25
¾-in.	1.60@1.85	4.70@4.80	4.50@4.75	4.25@4.50	4.00@4.25	5.00@5.25
Slack	1.35@1.60	4.40@4.60	4.00@4.00	3.75@4.00	3.85@4.00	4.95@5.05
Chicago (Williamson and Franklin Co.)[2]						
Lump	*1.60@1.75	3.75@4.00	3.75@4.00	3.50@4.00	3.75@4.00	4.00@4.50
Mine-run	1.10@1.15	3.25@3.50	3.25@3.50	3.00@3.50	3.50@3.75	4.00@4.25
Screenings	.95@1.10	3.25@3.50	3.25@3.50	3.00@3.50	3.50@3.75	4.00@4.25
Gross average[3]	*$1.94@2.10	$4.66@4.86	$4.64@5.03	$4.54@4.98	$4.74@5.11	$5.16@5.53

[1] F.o.b. Norfolk and Newport News. [2] Per net ton. [3] The highest average price made last year was $4.80@5.33 made on Nov. 25.
* Price lower than the week before. † Price higher than the previous week.

BUSINESS OPINIONS

Iron Age—That the United States Steel Corporation, with all the constriction of traffic late in the year and the shortage of coke, earned $106,000,000 in the last quarter of 1916, or far more than in the previous three months, indicates the advance the steel companies have made into their higher-priced orders. But even so considerable shipments are still going out at close to a 2c. basis for heavier products; hence larger earnings are yet to come. Though the Pittsburgh & Lake Erie embargo on Pittsburgh-Youngstown shipments came off Jan. 31, Pittsburgh district shippers look for no great clearing up of the railroad situation before April.

American Wool and Cotton Reporter—Scoured wools, particularly fine ones, were the feature of the wool market for the week under review. Mostly fine, foreign combing Capes have sold, bringing from $1.15 to $1.20. The last few days have shown a stronger tendency all around. Noils are higher and still very strong.

Dun—After a natural lull, the momentum of business increases, though there is no repetition of the feverish buying recently witnessed. Both domestic and foreign requirements, notwithstanding previous heavy purchases, remain extensive, but competitive bidding has largely subsided and the general situation is clearly more wholesome. Doubts regarding future supplies and prices cause hesitancy in many quarters and some buyers who are covered well ahead hold off in anticipation of concessions, yet where needs are pressing the element of cost is still little considered and premiums continue effective if special advantages on shipments are possible. Commercial failures this week are 333, against 358 last week, 359 the preceding week and 442 the corresponding week last year.

Bradstreet—Trade for nearby delivery broadens to the tune of higher prices and fears of insufficient supplies, but buying of staples for fall shipment proceeds in rather cautious fashion, recurring peace talk as well as high costs being the chief influences. While high prices elicit widespread complaints at the moment, activity reigns in wholesale, jobbing and retail lines, with buyers becoming more numerous at the leading markets and with retail distribution stimulated by cold weather as well as by clearance sales.

Dry Goods Economist—The present situation may be summed up in the statement that both buyers and sellers are averse to committing themselves any further ahead than they can avoid. It is recognized that the underlying conditions are strong, but the difficulty of forecasting future developments is so great as to have a very potent influence.

Marshall Field & Co.—Wholesale distribution of dry goods for the current week is substantially in excess of the corresponding period of a year ago. Our road salesmen are now on their territories showing many lines for fall delivery. While opening prices are higher than a year ago merchants are placing liberal orders to cover their needs for their fall trade. Road sales for immediate and spring delivery are running well ahead of the corresponding period of 1916. Many Western and Southern buyers have been in the market during the week.

Contract Prices

Boston—Consuming interests trying to get tonnage for the coming year are meeting with small success, and no contracts have so far been closed except to old customers. The favorable outlook in the export business which offers some advantages over domestic business, is attracting much attention. Four dollars and seventy-five cents per ton is easily obtained on this business. On the other hand some buyers are confident that any change in the price level must be downward and that better prices will prevail shortly.

New York—A contract involving 30,000 tons has been closed at $3, and two involving a total of 6000 tons were closed at $3.50, an increase of $1.60 over last year's prices. An option on 4000 tons at $2.50 was withdrawn when it expired, and another at $5 f.o.b. No bids were received in response to a request for between 60,000 and 100,000 tons of bunker coal for use of the Panama R.R. at New York Harbor. The contract was to become effective Apr. 15.

Baltimore—A break in the spot market has caused consumers to delay contracting until the usual period around Apr. 1. The best grades are ranging from $3.25 to $3.50 with the off qualities at $3, and the possibility of further declines before Apr. 1.

Philadelphia—One local concern has covered about 300,000 tons of its capacity at prices ranging from $3 to $3.50, and it is also reported that some very inferior grades have been closed at as low as $2.75, though nothing authentic is available on this. Consumers are generally taking the initiative on contracts where delivery begins immediately, but are holding off on Apr. 1 business.

Hampton Roads—Expiring contracts are being renewed at the prices previously announced, though but little interest is being shown in Apr. 1 business.

Lake Vessel Rates—About 1,500,000 tons of vessel capacity have been contracted for so far. The current rate from Lake Erie ports is 42½c. to the head of Lake Superior, and 45c. to Lake Michigan ports other than Milwaukee and Chicago. Rates at the opening of the season were 50c. to the head of the Lakes, and 60c. to Georgian Bay ports.

Pittsburgh—A leading interest is renewing expiring contracts with old customers on basis of $3, though limiting the tonnages. Negotiations are generally progressing slowly, buyers naturally hesitating to commit themselves at the ruling high levels because of the uncertainty as to the immediate future.

Buffalo—A local jobber reports a 60,000-ton contract closed at $2.75 net. Consumers are asking for quotations on contracts but generally refusing to meet the high figures asked.

Toledo—A contract has been closed here for 90,000 tons of coal for delivery between February of the current year and April next year, on the basis of $2 for mine-run coal. It is understood that a condition of the contract was a guarantee that an adequate car supply would

be furnished the producer. Pocahontas prices for the season are being held on the basis of $3@3.25, the $3 figure to apply on Lake contracts.

Cleveland—It is understood that a contract was closed here for 150,000 tons of No. 8 three-quarter coal for shipment to the Northwest, via the Lakes, at $3 f.o.b. the mine. Lake bunker coal contracts are being negotiated on the basis of $4 f.o.b. the vessel at Lake Erie ports, which figures out at $3.02 at the mine.

Columbus—Purchasing agents for large trunk lines are offering much more than formerly for tonnage; offers of $3.50 for mine-run for current needs are not infrequent and in some instances railroads have been compelled to pay $4.50 for fuel.

St. Louis—One or two contracts for Standard steam lump, wagon-load delivery in the city have been made at $2.05 for a period of one year. Figuring 60c. for hauling and 57½c. for freight rate, this leaves about 87½c. at the mine. For the Williamson County coal the price will be at least 50c. a ton higher on contracts. It is understood that 22,000 tons of screenings was contracted through the Chicago market this week to run to Apr. 1, 1918, at $1.65 the mines. It is further rumored that the Burlington R.R. has agreed to pay for its company fuel, $1.50 for mine-run and $1.85 for lump.

Birmingham—Two 12-month contracts involving 50,000 tons and 60,000 tons respectively have been closed at $2.25 per net ton at the mine for washed mine-run coal, and $2.50 has been obtained on a 30,000-ton contract for bunker coal. Contract prices range from $1.75 to $2.50 per ton, which is 75c. to $1 above the figures of a year ago.

Atlantic Seaboard

BOSTON

Contract sales not yet general. Hampton Roads spot prices continue to moderate. Georges Creek no factor. Pennsylvania coal offerings restricted as to season delivery. Anthracite receipts very light.

Bituminous—Offerings of Pocahontas and New River so far are confined to one or two large distributors inland from Boston. The same interests are not closing tonnage except to consumers who have had contracts with them the current year, and at this writing no sales are reported except for such delivery as can be made from rehandling plants that are in full operation. Consumers who are on Tidewater and are trying to get propositions for coal alongside through the twelve months are not meeting with much response. Apparently the Hampton Roads shippers feel in most comfortable position for the season's business.

To those interests who control steamers the offshore trade is most tempting. Ocean freights continue so high and the chance of building up a future trade is so favorable that it is probable that a large tonnage will be sold abroad early in the year. For all of this business the announced price of $4.75 f.o.b. can easily be had without some of the risks that accompany delivered prices in this territory, and furthermore a large bunker business at still higher prices is certain.

Apparently there is as much diffidence on the part of buyers as to purchases as there is on the part of the agencies as to sales. The New England manufacturers who have not already contracted feel that prices are on so high a level that any movement is likely to be downward. The car situation shows many signs of improvement, although the labor supply is still a baffling element in any predictions for 1917.

Spot prices are less firm. Fairly prompt coal has been quoted this week at less than at any time since November, and while this may signify only a temporary surplus on the part of smaller shippers yet it is more than likely as we approach Apr. 1, that spot prices will be modified considerably. On the other hand, small lots to clear steamers still command up to $6.75 f.o.b., and those in closest touch with the market are the ones who pay these prices.

Georges Creek coal is conspicuous by its absence. A few scattering cargoes come forward on 1916 contracts, but the shippers are so much in arrears that no discussion of 1917 contracts is possible.

Local adjustments of the wage scale are regularly being added to the prices at which many of the Pennsylvania operators have sold their coals. The contracts that were closed a month and six weeks ago on the $3.25@3.50 basis were subject to a mining clause which has now been taken advantage of to put into effect an advance that ranges in different districts from 11c. to 24c. per ton. So long as the prices indicated are well below the cost of spot coal in the open market the complaints are few, if deliveries are made with something like regularity. So many industrial plants are making extra profits that coal advances for the most part are being paid ungrudgingly.

At the New York and Philadelphia loading piers there is relatively a dearth of spot coal for sale and it is often difficult to fill out cargoes.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. and Somerset
Philadelphia	$5.75@6.50	$6.15@6.75
New York	6.00@6.80	6.40@7.00
F.o.b. mines	4.50@4.25	4.90@5.50
Alongside Boston (water coal)	8.00@8.25	8.25@8.50

Pocahontas and New River are quoted at $6.50@6.75 f.o.b. Norfolk and Newport News, Va., for spot coal, and $9@9.25 on cars Boston and Providence for inland delivery. On contract, Apr. 1 to Apr. 1, $7 is quoted on cars Boston, and $4.75 f.o.b. Hampton Roads.

Anthracite—There is no marked improvement in the receipts of domestic sizes, but there are signs of somewhat easier conditions. The demand for broken and egg is less insistent, although supplies are not any more plentiful. Several large retailers have had no broken coal for several weeks. Dealers try very hard to get shipments all-rail to help out their Tidewater receipts, and most of the inquiry here for "independent" coal is now for rail shipment. A few box barges are coming to Boston via the Cape Cod Canal, but the aggregate tonnage is small.

The hard coal trade seems to have settled into a routine. Consignees are as anxious as ever for shipments, but there are now fewer weeks left for winter conditions, and one way and another the ultimate consumer has managed to keep his fire going, and in many cases has accumulated ahead. Loading is slow, and shipments from the mines very irregular.

NEW YORK

Anthracite market nearer normal conditions with demand and prices easier. Buckwheat coals scarce and there is less premium coal. Contracting for bituminous coal slow. More free tonnages and mine prices lower. Bunkering coals scarce.

Anthracite—Prices are easier and demand is steady but not strong enough to create a shortage. Premium coals are less active and prices are changing frequently. There is not much coal offered but buying is also slow. Dealers find it difficult to get sufficient pea coal and buckwheat to take care of their orders and some of them are furnishing chestnut coal to large users of pea coal. Some factories that turned to the use of the buckwheat coals at the time of the flurry in bituminous early last fall are returning to the use of the latter.

Line trade is active, considerable premium coal being sent direct from the mine into New England. Chestnut is freer than either egg or stove and straight cargoes of the former are easier while mixed cargoes bring higher prices.

The greatest activity is in the steam coal situation and no increased supply is looked for until Mar. 1 when demand begins to decrease. Because of the lack of supplies wholesale houses are not talking contracts. Rice coal is practically out of the market, some dealers having none to offer at all.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	5.45	$7.25@7.75
Stove	5.75	7.25@7.75
Nut	5.70	7.00@7.50
Pea	4.00	6.50@6.75
Buck	2.75	6.00@6.25
Rice	2.20	4.50@5.00
Barley	1.95	3.25@3.75
Boiler	2.20	.....

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—There is much delay in signing contracts for the current year. Most operators are set against closing up for more than 50 per cent. of their output. Some are holding out for the new high prices which range from $3 to $3.50 per ton at the mines while many consumers are holding back for lower rates. During the week quotations made for new contracts have been withdrawn at the expiration of the time limit and renewals have been refused.

One contract was closed during the week for 30,000 tons of coal at $3. An option of 4,000 tons at $2.50 was withdrawn at its expiration as was another option on a lot at $5 f.o.b. Two contracts involving a total of about 6000 tons were reported closed at $3.50 at the mines, an increase of $1.60 over last year's prices. Another tonnage aggregating 4000 tons at $2.75 per ton was refused by one of the middle houses this week.

No bids were received by the purchasing department of the Panama R.R. for supplying the bunker coal requirements at New York Harbor, estimated at from 60,000 to 100,000 tons. The specifications called for "high-grade mine-run bituminous, equal to that furnished by the contractor to any other steamship line bunkering in New York Harbor." The expiring contract was made privately and the new contract was to become operative Apr. 15 next and extend one year. No announcement was made as to what course would be pursued.

More of the sharpness has disappeared from the market. Supplies are larger and prices are easier. Free coals are much more in evidence while contract holders are getting nearer their full requirements. Loading at the New York Tidewater piers is slow.

One of the elements in the softening of the market has been an improvement in working conditions, due to the settlement of labor difficulties at the mines and a slight betterment in car supply, which, however, remains bad on the Baltimore & Ohio and the Pennsylvania. No continued improvement is looked for unless there should be a heavy storm and an extended cold wave.

The New York Tidewater piers are free of embargoes but embargo orders are in effect on several Western roads, and also into Canada and in New England. Traffic on all roads is heavy but less than earlier in the season. Some of the railroads are said to have but a few days supply of coal and buying on their account is brisk.

Many grades have been out of the quotable Tidewater market and mine prices have been as low as $4 on some of the cheaper coals only to recover from 25c. to 50c. The local demand is spotty.

The export situation is quiet but with numerous inquiries. Bunker coal is slow and delays in sailings of transatlantic vessels are frequent, although loaders are worked day and night to get supplies aboard. Contractors have sent boats to other ports to get the coal required here for bunkering purposes.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	Port Reading	South Amboy	Mine Price
George Crk. Big Vein	$7.00@7.25	$7.00@7.25	$5.00@5.25
Tyson	6.75@7.00	6.75@7.00	4.75@5.00
Clearfield	6.50@6.75	6.50@6.75	4.75@5.00
South Frk.	6.75@7.00	6.75@7.00	5.25@5.50
Nanty Glo.	6.75@7.00	6.75@7.00	5.25@5.50
Som'r. Co.	6.50@6.75	6.50@6.75	4.25@4.50
Que'ho'ing.	6.75@7.00	6.75@7.00	4.75@5.00
W. V. Fa'rm't Th'r'qua.	6.25@6.50	6.25@6.50	4.50@4.60
Mine-run	6.25@6.50	6.25@6.50	4.50@4.60
West. Md.	6.00@6.50	6.00@6.50	4.25@4.50

PHILADELPHIA

Anthracite demand continues. Only one shipper up to normal tonnage. Speculation as to April reduction and new steam contract figures. Poor railroad movement. Steam coal continues active. Bituminous grades ease off again, although gas coals hold their own. More contracting.

Anthracite—The demand for all sizes continues and little or no headway has been made toward accumulating any reserves. Only one of the largest shippers seems to be keeping up its tonnage into this market, and it was only able to do this by drawing heavily on its storage stocks, which are now almost depleted.

Toward the end of last month some individual coal sold here at $5.50 at the mines for egg, stove and chestnut. There are also smaller retailers who are buying some coal at from 25c. to 50c. above circular, and making the consumer pay the increase. Owing to this we know of several instances of the retail price of pea coal being $6.25 per ton, with no complaint from the customer.

With the first signs of warm weather a sudden break in the market for the prepared sizes is liable. Shippers are all agreed that the unusual demand this season was due largely to the prosperity of the working classes. This being the case the dealers need never hope to persuade the average laboring man to buy his winter's coal in the summer.

Greater interest is evident in the new contract rates for the steam sizes. Some of the larger companies have the matter under consideration, and are being spurred on by the fact that the individual shippers are reported to have closed quite a heavy tonnage already. It is generally conceded that there will be an increase, but it is very doubtful if the increase will be as great as the individuals expect. It will be an interesting situation if the companies new rates are, say 25c. or 50c. lower than what the individuals have already contracted at.

The district attorney continued his search for evidence against the coal man for another week but this excites little comment except among the dealers themselves. It is interesting to note that the newspapers who cried "collusion" the loudest were among the others who advanced the price of their papers 100 per cent. to the public all on the same day.

Stocks of pea coal are being depleted at an alarming rate and shipments most discouraging. This being the cheapest family size the demand from now until spring will be enormous. Large buyers whose stocks were heavy during the early winter are in the market again and owing to the great scarcity of buckwheat some of the largest manufacturing plants have bought large blocks of pea. The storage yards are about exhausted, so pea coal has taken a place alongside of stove and the efforts to obtain it are almost as vigorous. Special pea coals such as Lykens Valley, have been taken by local dealers at as much as 35c. in advance of its circular. The three companies producing this grade are pretty well cleaned up now.

Instead of hoping for a late cold winter the dealers are now eagerly counting the days until

spring. The deliveries of the railroad are so slow that a notice of a shipment means little and it is a common occurrence to have coal en route for two weeks. As a specific instance of the poor transportation conditions, we know of one classification yard which received 1000 cars of coal in a single day, and during the night was only able to classify 70 cars for forward movement on account of only having one engine to do the work.

If there has been any bright side to the season's business it has been the wonderful improvement in collections. Dealers never sold so much coal for cash and of course were able to keep their accounts with the shippers in excellent shape.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buck	$2.00	$2.90
Egg	4.15	5.25	Rice	1.25	2.15
Stove	4.10	5.60	Boiler	1.10	2.00
Nut	4.50	5.55	Barley	1.00	1.90
Pea	2.80	3.70			

Bituminous — The high-class steam grades showed a slight easing off, the largest decrease being about 25c., while some grades showed as little as 10c. The gas coals remained in about the same position as last week; occasional sales were likely made at figures less than our quotations, but these were not in sufficient volume to make the market. Shipments again are in fair volume, especially from the Southern fields, as a number of embargoes against that section have now been eliminated.

Several of the local strikes in western Pennsylvania are reported settled for the time being but these are constantly recurring and are greatly diminishing the production. In addition much of the mine labor is being taken out of the regions by industrial agents and after every strike the defections of this nature are particularly severe.

The car supply in the western Pennsylvania territory has been about 20 per cent. of its requirements, while the West Virginia field is reported receiving about 30 per cent.

There is greater activity in contracting due probably to the fact that the market prices show a tendency to ease off. We know of one concern that has contracted about 300,000 tons of its production to date at prices ranging from $3 to $3.50, according to quality. We have also heard some reports of contracts closed at $2.75, but are certain this was only on most inferior grades.

In considering the contract situation it must be borne in mind that prices are also current for contracts dating for the year from Apr. 1 and this business is not near so active as contracts to date from the present time. There seems to be more consumers willing to close at present prices for immediate shipments than there are shippers to accept their offers but on the Apr. 1 business there is quite a little hesitancy and some sparring to get the proper perspective on conditions that may exist about Apr. 1.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein	$5.75@6.00
South Fork Miller Vein	5.50@5.75
Clearfield (ordinary)	5.15@5.25
Somerset (ordinary)	5.15@5.25
West Va. Freeport	5.00@5.15
Fairmont gas, lump	5.50@5.75
Fairmont gas, mine-run	5.25@5.50
Fairmont gas, slack	4.50@4.75
Fairmont lump, ordinary	5.00@5.25
Fairmont mine-run	4.75@5.00
Fairmont slack	4.50@4.75

BALTIMORE

Situation still uncertain due to railroad embargoes. Tidewater yards are still jammed with loaded cars, and spot prices are below contract quotations at times.

Bituminous—The coal market has not as yet recovered from the recent sweeping embargoes of the Baltimore & Ohio and Western Maryland roads which cut off shipments almost everywhere except to originating line points. During the period of congestion at Brunswick, Martinsburg and Cherry Run a number of Northern coal men with fuel awheel had the cars shipped to Baltimore in the hope that someone would buy it. This with other coal already destined here made a jam at tide. Locust Point soon stopped receiving coal and then Curtis Bay and Port Covington jammed up. Some cars were so well buried that they could not even be released for local delivery.

Spot prices broke, but the situation has been saved to some degree by increased bunker purchasing, and the removal of embargoes. With bunker coal here selling down to or below Hampton Roads prices, many vessels took over fuel at the Baltimore piers. Prices to the trade at the mines, and spot prices, mine basis, here, are at about an even level, as follows: Georges Creek Tyson, $4.75; Quemahoning, $4.25 to $4.50; South Fork, $4.25; Somerset, $4; Clearfield, $3.75 to $4; Freeport, $3.50; Fairmont gas, ¾, $3.50; same, run-of-mine and slack, $3.25.

The break in the local spot market had no effect on contract quotations. Its only result is that a number of consumers who were endeavoring to close yearly contracts at once, will now wait for the regular period around Apr. 1, hoping to buy more cheaply in the open market than on contract. Best grade steam coals are firm for 12-months contracts from Apr. 1 at around $3.25 to $3.50. Low-grade coals are offering around $3 and some are predicting that they may break below this before April.

Anthracite—The rail movement for hard coal has been bad the past week. Instead of having too much coal on hand the dealers are all short on some particular size. Orders are fairly brisk and deliveries below midwinter standard, and there is no chance of over-stocking.

Exports—The export movement is still quiet, the total loading last week being 15,818 tons, with 1217 tons bunker fuel.

HAMPTON ROADS

No further improvement in car supply. Several shippers very short. Three days' average delay to cargo steamers. No April contracts closed.

The car situation is about the same, several days of good supply being discounted by several days of poor supply. Transportation difficulties on the Virginian Ry., lack of motive power principally, and a wreck on the Norfolk & Western have had their effect on receipts at Hampton Roads, and a few shippers have suffered severely due to the arrival of a number of vessels at the same time. Practically all vessels were delayed to a certain extent last week.

Prices are on about the same basis as last week, with little free coal to be had. As long as the present situation as to car supply endures there will not be a softening of prices to any extent. Contracts expiring Jan. 1 for bunker coal for steamers and tugs and for export are being renewed but no business has been reported as closed as of Apr. 1. The tendency of both seller and buyer to await developments is still the rule.

Current prices for Pocahontas and New River are around $7 per gross ton for shipment coastwise and foreign, on tracks for local consumption $6.50@7 per net ton, bunker coal $7.50 per gross ton, plus trimming; anthracite, $9 per net ton, delivered.

Contract prices for Pocahontas and New River are $4.75 per gross ton for shipment coastwise and foreign; $5 per gross ton for bunker coal, plus trimming; $3 per net ton f.o.b. mines for line trade and local delivery.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Jan. 5	Jan. 13	Jan. 20	Jan. 27
Nor. & West	110,673	111,316	137,103	138,413
Ches. & Ohio	78,839	118,613	103,335	81,835
Virginian	46,220	69,372	85,661	111,799
Total	235,732	299,301	326,099	332,047

Ocean Shipping

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Roar[3]	St. Thomas, D.W.I.	1,631
Giulio Cesare[1]	Genoa, Italy	4,928
Viator[3]	Manzanillo, Cuba	1,174
Alessandra[3]	Buenos Aires, A. R.	3,911
Edward Pierce[4]	San Juan, P. R.	6,205
Capri[1]	Bagnoli, Italy	3,176
Skogland[1]	Bagnoli, Italy	4,077
William E. Downs[1]	St. Georges, Bermuda	861
Hugo[3]	Kingston, Jamaica	2,208
Edward H. Blake[6]	Kingston, Jamaica	773
Carlo[7]	Italy—Any port	6,301
Cuthbert[8]	Para, Brazil	1,619
Seward[5]	Havana, Cuba	3,806
Achilles[1 9]	Cristobal, C. Z.	12,048
Anna Maersk[9]	Cienfuegos, Cuba	2,052
Salonica[8]	Buenos Aires, A. R.	3,616

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Negus[2]	Port of Spain, Trinidad	3,629
Negus[2]	Guanoco, Venezuela	259
Keyvive[9]	Vera Cruz, Mexico	1,280
Dorothy B. Barrett[2]	San Juan, P. R.	2,844
Agamos[10]	Valparaiso, Chile	3,558
Gardiner G. Deering[2]	San Juan, P. R.	2,777
Dagland[3]	Cardenas, Cuba	1,536
Munrio[3]	Havana, Cuba	5,256

PHILADELPHIA

Orkild	Havana
Sinaloa[3]	Sagua la Grande

BALTIMORE*

Ferrona	Iquique
Samuel P. Bowers	Vita
Ryvarden	Guantanamo
Wilmore	Marseilles

* Under a Customhouse regulation, after request for secrecy, the size of individual cargoes is not made public. The total tons exported for the week was 15,818.

[1] Pocahontas Fuel Co. [2] Berwind-White Co. [3] Castner Curran & Bullit. [4] Baker-Whiteley Co. [5] Smokeless Fuel Co. [6] Hasler Bros. [7] Flat Top Fuel Co. [8] C. & O. Coal & Coke Co. [9] C. G. Blake Co. [10] West Va. Coal Co.

COASTWISE FREIGHTS

Two dollars and fifty cents from Hampton Roads to Providence and $3 to Boston is still the quotable rate on barges. Practically no sail tonnage is offering. No season rates are heard in the open market, although coal inland from Boston is being placed on the basis of $2 from Norfolk for the twelve months beginning Apr. 1.

It was recently announced that interests allied with the Consolidation Coal Co. had acquired control of the Coastwise Transportation Co. The latter is owner of such steam colliers as the "Plymouth," "Franklin," "Norfolk," "Suffolk," "Bristol," "Transportation," "Coastwise," etc.

For New York loading to points on Long Island Sound, barges have been chartered at $1 flat this week, but $1.15@1.25 continues the asking range. Only a few shippers are in position to give dispatch.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

BALTIMORE

Vessel	Destination	Tons	Rate
Jelling	Havana	1,673	
Wilmore	Marseilles	3,448	
Rhine	River Plate	1,554	
Timcuedra	River Plate	1,487	
Mandeville[1]	Tela	1,038	
Levisa	Cuba	1,259	
Sangstad	Cuba	1,459	
.....[2]	River Plate	3,000	$20 70

VIRGINIA

James B. Drake	Bahia[3]	991	[1]17 00
Senta	Pernambuco		17 50

NEW YORK

Winnegance	San Domingo	213	7 25

ATLANTIC RANGE

Jelling	Havana	1,673	4 25
Norden	Havana	1,564	4 25
Nordamerika	Havana	1,685	4 25

NORFOLK

Seward	Havana	2,080	
Suffolk	Rio Janeiro	2,868	

NEWPORT NEWS

Ellen Little	Porto Rico	£07	

HAMPTON ROADS

Ella M. Willey	Para	735	[1]14 00

[1] Feb. [2] Or Virginia. [3] Or Penambuco.

OCEAN FREIGHTS

During the past week we chartered a number of steamers for export coal, but only one of these, the "Blaamyra," has been reported and this, incorrectly. Freight rates continue to advance, and steamers are becoming more and more difficult to obtain.

We would quote freight rates on coal by steamer as follows:

	Jan. 22	Jan. 29
Europe		
West Coast Italy	$48.00 about	$48.00 about
Marseilles	46.80 about	46.80 about
Barcelona*[2]	28.80@31.20	25.20@26.40
South America		
Montevideo	21.60@22.80	22.80@24.00
Buenos Aires	21.60@22.80	22.80@24.00
Rosario	24.00@25.20	24.00@26.40
Rio Janeiro	[3]18.00 about	[3]18.00 about
Santos	[3]19.50 about	[3]19.50 about
Chile (good port)	12.00@14.00	13.00@14.00
West Indies		
Havana	4.25@4.50	4.25@4.50
Cardenas, Sagua	6.00 about	6.50 about
Cienfuegos	6.75 about	7.00 about
Port au Spain	9.00@10.00	9.50@10.00
St. Lucia	9.00@10.00	9.50@10.00
St. Thomas	8.00 about	8.00@8.50
Barbados	9.10 about	9.50@10.00
Kingston	7.00 about	7.50 about
Curacao[1]	7.50 about	8.00@8.50
Santiago	6.75@7.00	7.00 about
Guantanamo	6.75@7.00	7.00 about
Bermuda	6.00 about	6.00 about
Mexico		
Vera Cruz	9.00@10.00	9.00 about
Tampico	9.00@10.00	9.00 about

* Spanish dues for account of cargo. [1] And p.c. [2] Or other good Spanish port. [3] Net.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

PANAMA CANAL

Fuel movement through the canal for the week ended Jan. 12 was as follows:

Vessel	From	To	Tons
Republic	Baltimore	Valparaiso	[1]5,400
St. Ronald	Baltimore	Callao	[2]3,800
Texan	Norfolk	Pearl Harbor	10,973

[1] General cargo, coal and coke. [2] Coke and pig iron.

Ohio Valley

PITTSBURGH

Lifting of an embargo temporarily advances spot market. Contracting proceeding slowly.

For the three business days Friday, Saturday and Monday, the Pennsylvania R.R. lifted its embargo on coal destined for Youngstown and similar points and there was a heavy movement. Buyers in the district opened up purchased freely as they did not know when they would have another chance and the spot market was set up sharply, particularly on steam coal, all descriptions of coal bringing about $5 a ton for spot shipment. The embargo went on again at midnight, Monday, Jan. 29.

Cars promise to be scarce all week, but there is more free coal available to those not embargoed and the general impression seems to be that the market will ease off to the level obtainable a week or two ago, if not to a still lower level. On the other hand it may be that owing to the special efforts made to get coal through to the region opened up by the embargo a shortage for shipment elsewhere developed which may keep the market as high as ever.

Contracting for coal is proceeding rather slowly, consumers hesitating about paying double price for coal when the delivery period involved does not end until 14 months hence, as conditions may be altogether different before the period expires. It is well established that the leading interest is renewing contracts with some old customers on the basis of $3, but it is represented that these are not open market transactions, the seller picking out the buyer more or less, and not closing for as large tonnages as heretofore. Sales of ¾-in. gas coal at $3.50, recently reported, are regarded as somewhat exceptional, no general buying of gas coal having followed. The open market on contracts appears to be quotable at $3.25, with very little being done. We quote spot coal at about $4.50 for slack, $4.75 for steam mine-run and $5 for ¾-in. gas per net ton at mine, Pittsburgh district, with possibilities of a decline owing to the restoration of the Pennsylvania embargo.

BUFFALO

Weather conditions and car supply make the market. Bituminous prices unexpectedly stronger. Anthracite plentiful in Buffalo, but scarce outside. Canada anxious over supplies.

Bituminous—Stiff winter weather and a greater scarcity of cars have given added strength to the market and promises to hold prices firm for a while. The car shortage seems to be more a matter of inadequate motive power and men than anything else and this cannot be made up at all readily. It is likely to be spring before the movement is once more adequate.

About the former difference of 50c. still exists between jobber and shipper. The jobber insists on $3 for everything and is offered $2.25. One jobber reports a 60,000-ton contract for $2.75 net, but even such are few. Consumers are now asking for contract prices, but they are mostly private buyers and they refuse to pay what is asked. City and other public tenders will be on the market in about a month.

Bituminous prices are up somewhat, on account of the added difficulty in getting coal to destination and the fact that the supply in consumers' hands is not keeping up. Pittsburgh is again very stiff at prices from 25c. to 50c. over a week ago, as follows:

Youghiogheny Gas	$6.25@6.75
Pittsburgh Steam	6.00@6.50
Ohio No. 8	6.00@6.50
Allegheny Valley	5.75@6.25
Pennsylvania Smokeless	5.90@6.40
Cambria Co. Smithing	5.95@6.45
All Slack	5.85@6.35
Cannel	5.90@6.40

Anthracite—The market is more than ever disturbed by car scarcity, so that the shippers are endeavoring to find ways for covering their outlying territory. They are well enough supplied as far as Buffalo goes, but it is next to impossible to get any further. Practically every railroad to the West and North is embargoed, either on its own order or on the order of a connecting road, so that every expedient has to be used to get coal to destination.

This city is full of Canadian dealers, seeking for some plan of transportation that will get the coal to their stations. Some of them are half convinced that some shipper is holding their coal back and they are bound to see that nobody is played a favorite.

TORONTO, CAN.

Anthracite coming forward freely. Bituminous still scarce and prices high. Toronto officials favor proposition for municipal coal yard.

While anthracite coal has latterly been coming forward in sufficient quantities to avert danger of an acute scarcity, the situation as regards bituminous shows little if any change for the better. Deliveries are only sufficient to satisfy immediate requirements and prices continue high.

Public opinion is strongly in favor of government or municipal action. The Toronto Board of Control has adopted a resolution in favor of a municipal coal yard and will ask the Provincial Legislature to pass the necessary legislation authorizing the city to establish it at an estimated cost of $2,000,000.

Quotations for best grades per short ton are as follows: Retail anthracite, egg, stove, and nut, $9.50; grate, $9.25; bituminous steam, $15; slack, $14; domestic lump, $10; cannel, $10. Wholesale f.o.b. cars at destination bituminous three-quarter lump, $9 to $10; slack, $10.

CLEVELAND

Prices holding firm. Railroads short of fuel. Price of bunker coal for Lake steamers likely to be $4 for coming season.

The cold and stormy weather has strengthened the local market and prices have been firm for several days. Car supply has been somewhat better but the lack of motive power has prevented the railroads from moving the coal promptly and consequently the increased car supply has not helped the consumer to any great extent. In fact some of the railroads here were so short of engine fuel that they were compelled to go into the open market and buy anything they could get.

A few operators in the Pittsburgh No. 8 district have been figuring on contracts for the new year beginning Apr. 1, and it is reported that one operator has closed a contract for 150,000 tons No. 8 three-quarter to be shipped to the Northwest via Lakes on the basis of $3 net ton f.o.b. mine. It is also stated that a few contracts have been made for bunker coal for Lake steamers for the coming year at $4 net ton f.o.b. vessel, Lake Erie ports. This is on the basis of $3.02 at the mines, plus 90c. rail freight and 8c. loading charge.

Lake coal shippers are having trouble contracting vessel tonnage for the coming season. The freight rates have been advanced to 50c. to Lake Superior ports, and 60c. to Lake Michigan ports. Even at these advanced rates vessel owners are not anxious to contract and are withholding considerable capacity for free cargoes that may show a better profit than the contract business.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$6.00	$6.00	$5.90
Cambridge	6.00	6.00	5.90
Middle Dist.	6.00	6.00	5.90
Hocking	6.00	6.00	5.90
Yough'gheny	6.50	....	6.00
Pittsburgh	6.50	....	6.00
Pocahontas	....	6.50	....
Fairmont	6.00	....	5.90

TOLEDO

Demand good and prices high. Embargoes on roads between Detroit and Toledo. Developments on new contracts.

The local market is good and prices are extremely stiff, ranging from $4.50 to $5. The car congestion continues serious and embargoes are still in force by Michigan roads. Detroit is clamoring for coal and a serious shortage is threatened. It is hoped by placing an embargo on Detroit to Toledo shipments in other commodities to help the coal movement. Local concerns have thus far been able to meet the requirements of Toledo people in fair shape.

There are good inquiries among local coal concerns relative to contracts but Toledo dealers and jobbers are inclined to go slow in signing up. A prominent local concern recently took a contract for 90,000 tons of coal to be delivered between February, 1917, and April, 1918, on a basis of $2 for mine-run coal with a guarantee of cars furnished every day during the life of the contract. The contract would not have been made but for the car guarantee. Pocahontas prices this season will run from $3 to $3.25, the Lake coal to be about $3 during the summer season.

DETROIT

Slight improvement in the supply due to embargoes on classes of freight. Lake vessel contracting active.

Bituminous—Freer movement of coal into Detroit was reported the latter part of last week in consequence of the embargo by railroads against shipments of other freight. The embargo was on only one week which was too short an interval to bring in sufficient coal to assure protection against a shortage. Nearly all the coal arriving was sold before it reached Detroit and there was no opportunity to accumulate any reserve.

Though there was a small improvement in supply, demand from steam coal users was actively maintained and practically no change in prices resulted. Jobbers are quotting all sizes at $5.25 to $5.50 at the mines. Demand also has been urgent for domestic sizes with the supply insufficient due, in part, to diversion of lump coal for use in steam plants.

Anthracite—Very little improvement appears in the supply of anthracite and there is a steady demand from consumers. Retail dealers in some instances are reported getting $11.25 a ton for coal which sold at $8.50 and $8.75 in October. Notice has come to some of the wholesalers of an advance of 40c. a ton by certain of the operators.

Lake Trade—Efforts of shippers to contract for vessel capacity were continued during the week and in several instances contracts are reported to have been closed on the basis of a rate of 42½c. from Lake Erie ports to docks at the head of Lake Superior and 45c. to ports on Lake Michigan, other than Milwaukee and Chicago. One large shipper has arranged contracts covering 900,000 tons. It is estimated that about 1,500,000 tons has been contracted so far. The first deal reported was at a rate of 50c. to the head of the lakes and 60c. to ports on Georgian Bay.

COLUMBUS

Strength is the characteristic feature of the local trade. Demand for both domestic and steam sizes is good and prices continue high.

Buying of both steam and domestic tonnage is brisk and prices are tending to higher levels. The car shortage and congestion on many lines continues, and this is by far the worst feature of the trade at this time. It is believed that the high price list will be continued for several months.

Domestic trade is active in every way as dealers are buying briskly, mostly for immediate shipment. Retail stocks are not heavy but they are sufficient to take care of current needs. Householders are now in the market for renewed stocks, as their first purchases are becoming exhausted. Pocahontas and other fancy grades are in good demand. Retail prices are ruling firm at the levels which have prevailed for several weeks. Anthracite is one of the strongest points in the trade as stocks in this section are rather light.

Steam trade is also active as manufacturing is still brisk. Many of the larger consumers are being taken care of on a hand-to-mouth basis, as they have been unable to accumulate stocks. Embargoes on many railroads has caused a distinct fuel shortage in some localities. In a number of instances plants have been compelled to suspend operations because of lack of coal. Steam prices continue firm and every change is toward higher levels. There is a good demand for railroad fuel as the freight movement is large.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$4.75	$5.00	....
Inch and a quarter	4.75	5.00	$5.00
Three-quarter inch	4.75	5.00	5.00
Nut	4.50	5.00	4.75
Egg	4.50	4.75	....
Mine run	4.50	4.50	4.75
Nut, pea and slack	4.50	4.50	4.75
Coarse slack	4.50	4.50	4.75

CINCINNATI

Active demand persists in spite of milder weather. The car situation has not improved.

Comparatively mild weather has kept the demand below what it would otherwise have been especially as to prepared grades, but the strength of the market remains unimpaired. The active operations of industrial plants is causing the heaviest demand for steam coal which has been experienced in years.

Indications are that operators are going to have things their own way when it comes to contracting, as large buyers are eager to close while the operators are holding off. Retail dealers have had no chance to accumulate any reserves, and if the usual February cold snaps develop they are bound to be forced into the market in increasing numbers.

LOUISVILLE

Moderating weather relieves pressure in part. Some easing up in the car stringency. The market continues strong.

With return of milder weather the market has eased up while at the same time operating and transportation conditions have been improved. Prices are not quite as stiff, although the amount of free coal is small. The retail demand is holding up, retailers and consumers apparently wishing to stock in preparation for cold spells which are still expected.

Eastern Kentucky prices, f.o.b. the mines are quoted at $4@4.50 for block; $3.75 for mine-run, and $3.75@4 for nut and slack.

Western Kentucky prices range, f.o.b. the mines, lump, $2.75@3; mine-run, $2.25@2.50.

BIRMINGHAM

Demand good in steam coal market, with prices holding firm. Warm weather restricts domestic inquiries. Car supply slightly better.

Spot business is good, and contract bookings represented a large aggregate tonnage Contracts were made for 50,000- and 60,000-ton lots for delivery over a period of twelve months at $2.25 per net ton mines for washed mine-run, and $2.50 was obtained for 30,000 tons of bunker coal. Contract prices range from $1.75 to $2.50 per ton, dependent upon the grade, quantity and term of deliveries. Prices range from 75c. to $1 per ton over those a year ago, except in railroad fuel contracts where the increase is not so marked. Spot prices on steam grades run from $2 to $3 per net ton mines for mine-run. Blacksmith coal $3.50 to $4.50 per net ton at mines.

The domestic market is unsatisfactory, due to the spasmodic weather conditions, and the stiff prices are holding orders down to the minimum. Lump coal is scheduled at from $3.50 to $4.25 per net ton mines.

Coke

CONNELLSVILLE

Spot market narrow. Large shortage at blast furnaces. Shipments slightly decreased.

The spot furnace coke market has remained at about $9 since last report, with a light turnover. The few operators who have any spot coke are trying to get all they can, while consumers are more settled in their views and refuse to pay as much as $9, except in occasional instances, preferring to do without.

The shortage of coke at furnaces tributary to the Connellsville region is estimated as averaging about 20 per cent. The furnaces meet the situation either by banking or by running slow. The shortage is approximately as great with furnaces having coke ovens of their own as with furnaces depending upon contracts.

Several sales of spot foundry coke have been made at $10.50 to consumers, and usually $10 to dealers. The turnover is small.

There is nothing new in the matter of contract prices, and we quote the market as follows: Spot furnace, $9; contract, $6@8.50; spot foundry, $10@10.50; contract, $8.25@8.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Jan. 20 at 347,490 tons, a decrease of 5702 tons, and shipments at 346,823 tons, a decrease of 3576 tons.

Buffalo—The market is active and as strong as ever. No consumer has what he calls a supply and some are so nearly out that they do not think of complaining of the price. The ovens appear to have made $10 a maximum price which, with $1.85 net for freight to this market, makes the f.o.b. Buffalo price $11.85 for Connellsville foundry, $10.85 for furnace and $9.85 for the lower grades.

Chicago—The coke situation remains about the same, the supply being short and byproduct sizes practically out of the market. Whenever any free coke is available the price ranges from $11 to $13 per ton.

Birmingham—The foundry coke market continues strong, with stiff prices ruling in both the contract and spot market. A contract was made during the week for high-grade foundry coke at $10.50 per net ton ovens for delivery over a period of twelve months. The minimum contract price is $8 per ton. Spot quotations are from $10 to $11 per net ton ovens, with specified deliveries not guaranteed. The supply of free coke is very scarce, and practically no new contract business can be taken on, the refusal of the consumer to renew an old contract at the present high prices affording the only avenue through which a new customer may secure his requirements in this district. The furnaces are consuming an abnormal quantity of furnace coke on account of the rainy season prevailing and there is no free product of this grade.

Middle Western

GENERAL REVIEW

Demand continues strong and prices firm. Anthracite situation worse. Smokeless coals higher.

In western territory the demand continues strong and prices are practically on the same basis as last week. There is more of a tendency on the part of retail dealers to stand aloof, and they have been buying from hand to mouth this week, evidently with the feeling that warmer weather is near when prices will be easier. Temperatures hovered around the zero mark for about ten days delaying transportation, and heavy snow falls have made retail deliveries slow and difficult. The tonnage moving to distributing centers has been somewhat reduced.

Demand for steam coal holds up in a surprising manner, and inadequate car supply has barely enabled operators to make sufficient deliveries to meet steam contracts. It is quite possible that if transportation conditions do not improve, prices will advance further before the final drop usual with the advance of spring. Any decline that does occur will be very gradual as few sellers will commit themselves at lower prices than now prevail.

Calls from the Northwest have been more insistent for all-rail coal from Illinois mines, and predictions are made that the Northwest will absorb any surplus tonnage at the southern Illinois mines during the next sixty days. While handling and switching of cars in terminals is better there is still room for improvement. The higher demurrage charges have not yet had any marked effect as most of the coal is billed direct to bona fide buyers on orders placed a number of weeks ago.

Interest in the Western contract situation is growing. Considerable doubt exists as to what will be done in the West, and the situation is being carefully studied by the wholesalers and operators. Higher prices are undoubtedly warranted on account of the Eastern situation and the higher cost of Lake coals. New contracts will undoubtedly be more stringent than ever before, and producers will be allowed wider latitude than usual. It is also sure that the time of delivery will be placed entirely in the hands of the operators, since they are so completely at the mercy of the railroads in the matter of car supply.

CHICAGO

Prices firm. Supplies still short. Anthracite and smokeless very scarce.

The demand from all quarters for Franklin County domestic sizes has been strong. Free domestic lump has been sold readily in Chicago at from $3.75 to $4, and mine-run and screenings at $3.50. Steam coal and screenings are generally running about 50c. per ton lower in price than the domestic sizes. In Saline County, where contract coal is mostly produced, the car shortage is still acute. Chicago retail buying from southern Illinois mines has been brisk.

Central Illinois mines have hardly had enough orders to take care of the free coal produced this week, and prices have been slightly easier. Renewed orders to this district have come from Michigan which has been of assistance in stemming a decline. Steam users seem prone to take nothing more than their contract obligations from this district lately.

But little Indiana domestic coal is in the hands of Chicago retailers and prices have been strong with tonnage inadequate to meet orders from Chicago and surrounding territory. The demand from the state and Michigan has been lively, and has caused prices to remain stiff. The Public Service Commission of Indiana has recently ordered the railroads in that state to give preference to coal shipments. The commission also raised reconsignment charges so high for a period of sixty days that shippers will find no profit in reconsigning coal shipments.

The smokeless market has been strong, with prices ranging from $4.50 to $5 on both prepared sizes and mine-run. The railway tie-up has again put retailers and consumers in a place where immediate deliveries are demanded. Indications pointed to retailers holding off with a view to forcing prices down, but inadequate supply towards the close of the week brought about a radical change.

Hocking and splint have been bringing about $4, with little tonnage arriving. Eastern Kentucky coal is not in a very favorable position owing to extreme car shortages.

The demand for anthracite continues strong because of weather conditions, and independents are securing most any price they quote. The old line companies have increased their prices 25c. a ton, making the Chicago price on chestnut $7. The various embargoes in the East have caused the situation to become even tighter.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump	$3.25@3.75	$3.50@4.00	$3.25@3.75	$3.25@3.75	$3.75@4.00
Steam lump	3.00@3.25	3.25@3.75	3.00@3.50	.....	.....
Egg	3.25@3.50	3.25@3.75	3.25@3.75	3.25@3.75	3.75@4.00
Nut	3.00@3.50	3.25@3.75	3.00@3.50	3.00@3.25	.....
Mine-run	3.00@3.25	3.25@3.75	3.00@3.50	2.75@3.25	3.25@3.75
Screenings	2.75@3.25	3.25@3.75	3.00@3.25	2.75@3.25	3.00@3.50

	Wlmson. & Frankln. Cos.	Saline & Harrisburg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.75@4.00	$3.75@4.00	$4.75@5.25		$4.50@5.00
Egg	3.75@4.00	3.75@4.00	4.75@5.25		4.25@4.50
Nut	3.75@4.00	3.75@4.00	.....		3.50@4.00
No. 1 nut	3.75@4.00	.....	.....		.....
No. 2 nut	3.50@3.75	.....	.....		.....
No. 3 nut	3.25@3.50	.....	.....		.....
No. 1 washed	3.75@4.00	.....	.....		.....
No. 2 washed	3.25@3.50	.....	.....		.....
Mine-run	3.25@3.50	3.25@3.50	4.50@5.00		4.00
Screenings	3.25@3.50	3.25@3.50	.....		.....

No arrivals

Hocking Lump $4.00. Splint Lump $4.00.

ST. LOUIS

Railroad congestion principal cause of coal shortage and high prices. Situation apparently getting worse. Warmer weather tends to make the market easier. Steam sizes in unusual demand.

Erratic weather conditions have created a feeling of uncertainty. The shipping trade are hoping for some severe winter that will tone up the market and prevent a collapse. The call for steam coal is good, especially on the smaller sizes, and the railroads still draw heavily on mine-run coal from all of the fields.

The chief reason for a stiff market at this time is the inability of the railroads to take care of more than 25 per cent. of the traffic on their lines. At every distributing point there is a congestion that seems entirely unwarranted, with exception of two or three roads. At St. Louis the Terminal Association and the majority of its participating carriers are holding coal anywhere from one to two weeks, and are causing a car shortage by not moving empties promptly back to the delivering line. There is a scarcity of anthracite here right now on account of embargoes by some Eastern roads.

On Illinois coals the Standard field is fluctuating and is a day-to-day proposition. The Operators' Association in this field does not make any effort to control prices in a market like this; it has figured the cost of producing coal and leaves the operator to use his own judgment. The same can be said of the independent operators from the high grade field. For this reason the Standard market is always easy and is depended upon by large interests who formerly used the high grades. It is estimated that the high-grade tonnage in St. Louis and vicinity has been cut down fully 75 per cent., and a large portion of this business is lost forever.

In the Williamson & Franklin field there is very little demand, but the circular prices are holding. The steam sizes are strong and the tonnage moving this way is for points beyond. The prevailing market at St. Louis per net ton f.o.b. mines is about 25c. under the country market, and is as follows, per net ton, f.o.b. mine:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$3.00@3.25	$2.75@3.00	$2.50
3x6-in. egg	3.00@3.25	2.75@3.00	2.35
2x3-in. nut	3.00@3.25	2.75@3.00	2.35
No. 2 nut	3.00@3.25	.....	2.35
No. 3 nut	3.00@3.25	.....	.....
No. 4 nut	3.00@3.25	.....	.....
No. 5 nut	2.75@3.00	.....	.....
2-in. screen	2.75@3.00	2.50@2.75	2.35
2-in. lump	.....	.....	2.35
3-in. lump	.....	.....	.....
Steam egg	.....	2.75	2.35
Mine run	2.75@3.00	2.50@2.75	2.25
Washed			
No. 1	3.50	3.25	.....
No. 2	3.00@3.25	3.00@3.25	.....
No. 3	3.00@3.25	2.75@3.00	.....
No. 4	3.00@3.25	2.75@3.00	.....
No. 5	2.75@3.00	2.50@2.75	.....

Rate on Williamson & Franklin Co. is 72½c. Rate to other fields is 57½c.

General Statistics

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the Pennsylvania Railroad Co.'s lines east of Pittsburgh and Erie for December and the 12 months of 1915 and 1916, in short tons:

	December 1916	December 1915	12 Months 1916	12 Months 1915
Anthra	962,106	1,079,076	11,996,964	10,953,209
Bitumin	3,828,420	4,298,382	48,167,136	44,514,366
Coke	1,115,255	1,195,899	14,257,911	12,018,404
Total	5,905,781	6,573,357	74,422,011	67,485,979

Foreign Markets

GREAT BRITAIN

Jan. 19—The coal market remains about unchanged. Prices are maintained, there being little available coal.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$7.20@7.44
Best dry coals	6.96@7.20
Best Monmouthshires	6.96@7.20
Seconds	6.24@6.48
Best Cardiff smalls	4.80@5.04
Cargo smalls	4.32@4.56

The prices for Cardiff Coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Rates are inclined to sag on account of dearth of orders, and further restrictions. This does not apply to Allied Mediterranean ports, where there seems a probability of an increase in limitation rates.

Gibraltar	$10.20	Port Said	$19.20
Marseilles	14.04	Las Palmas	9.00
Genoa	14.28	St. Vincent	10.20
Naples	13.80	River Plate	13.20
Alexandria	19.20		